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WAKE COUNTY
THOROUGHFARE PLAN

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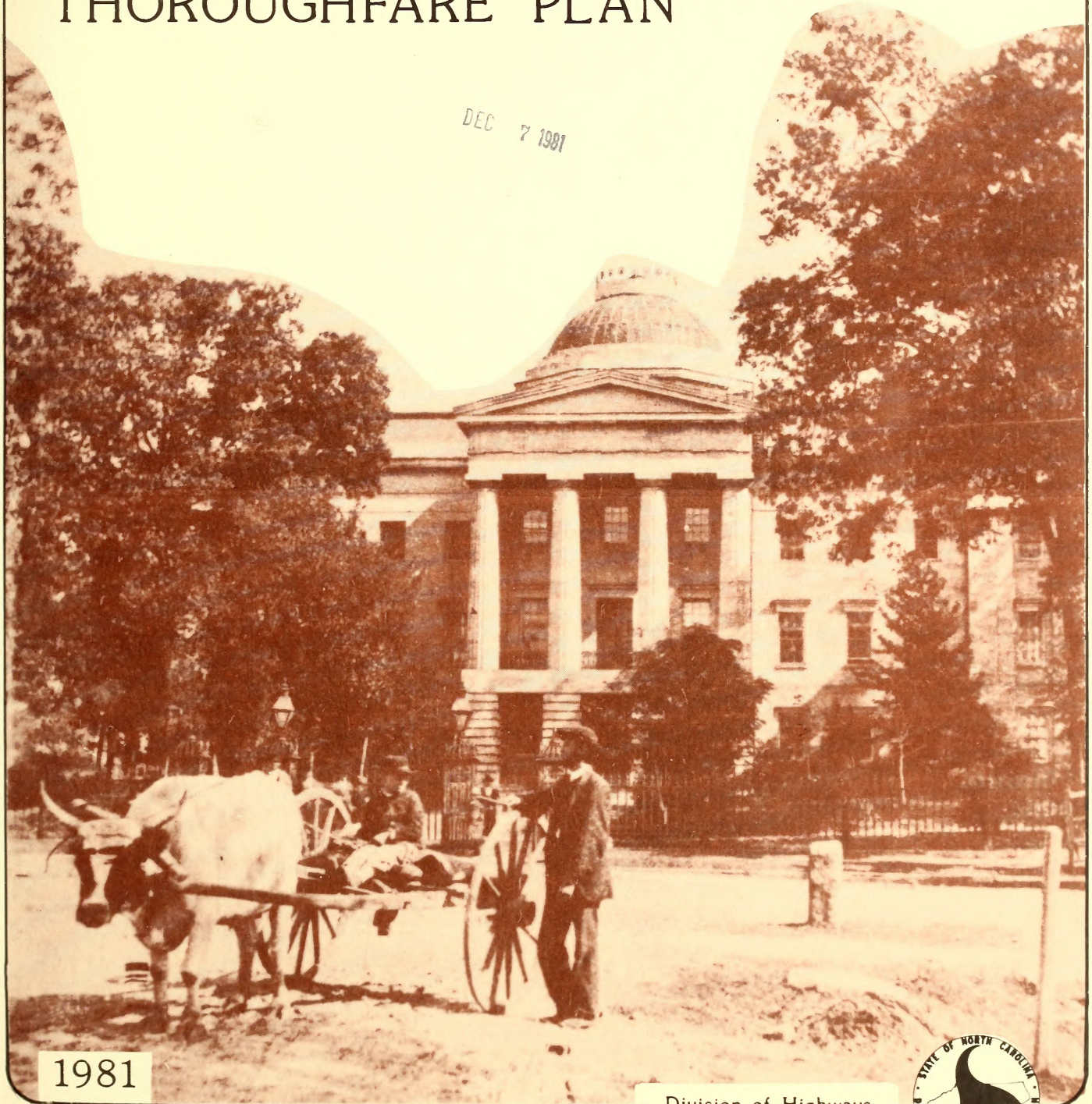

1981

Division of Highways

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

THOROUGHFARE PLAN

for

WAKE COUNTY, NORTH CAROLINA

Prepared by the:

Thoroughfare Planning Unit
Planning and Research Branch
Division of Highways
N. C. Department of Transportation

In cooperation with:

The County of Wake
The Federal Highway Administration
U. S. Department of Transportation

September, 1981

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I. INTRODUCTION

The economic and social well-being of a region is largely dependent upon an adequate overall transportation system. Unless people and goods are able to move from one place to another quickly and conveniently, the area becomes dormant and unable to develop to its full economic potential. Realizing this key role that highways play in this transportation system, it has become increasingly necessary to develop a good continuous network of national, state, and regional highways which can efficiently handle present and anticipated traffic needs.

Wake County has a thoroughfare plan that was cooperatively prepared in 1972 by the county and the North Carolina State Highway Commission. Due to the county's rapid and expanding growth in recent years, it was mutually agreed to reevaluate and update the existing plan. The revised plan is better suited for meeting the current and future travel needs of the county.

The proposed system of thoroughfares was developed following the basic principles of county thoroughfare planning as described in Chapter II. Thoroughfares were located based upon field investigations, aerial photography; existing and anticipated land use, population distribution, and topographic conditions. The plan advocates those improvements which are felt to be essential for proper traffic circulation within the current planning period (1980-2000). The plan does not attempt to modify proposed municipal thoroughfare plans already developed for the municipalities of Raleigh-Cary-Garner, Fuquay-Varina, Apex, Wake Forest, Wendell, and Zebulon.

Proposed improvements within the county plan will be primarily the responsibility of the North Carolina Department of Transportation. However, Wake County through the use of subdivision and zoning controls can do much toward the implementation of the plan. Thus, it is desirable that the plan be formally approved by both the county and the Department of Transportation to serve as a mutual official guide in the development of the thoroughfare system.

II. COUNTY THOROUGHFARE PLANNING PRINCIPLES

Purpose of Planning

There are many benefits to be gained from thoroughfare planning, but the primary objective is to assure that the road system will be progressively developed in such a manner as to adequately serve future travel desires. Thus, the cardinal concept of thoroughfare planning is that provisions be made for street and highway improvements so that as needs arise feasible opportunities to make improvements exist.

The major benefits derived from thoroughfare planning are: (1) Each road or highway can be designed to perform a specific function and to provide a specific level of service. This permits savings in rights-of-way, construction, and maintenance costs, protects residential neighborhoods, and encourages stability in travel and land use patterns. (2) Local officials are informed as to future improvements. Developers can design subdivisions to function in a non-conflicting manner. School and park officials can better locate their facilities. Irretrievable damage to property values and community appearance, as is sometimes associated with improvements programs, can be minimized.

County Thoroughfare Planning Concept

Streets, roads, and highways perform two primary functions--they provide traffic service and land service. These two functions when combined are basically incompatible. The conflict is not serious if both traffic and land service demands are low. But when traffic volumes are high conflicts created by uncontrolled and intensely used abutting property result in intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets, roads and highways which permit travel from origins to destinations with directness, ease, and safety. Different elements in the system are designed and called on to perform specific functions and levels of service, thus minimizing the traffic and land service conflict.

Within the county plan elements are considered to be either urban or rural. In the urban planning area, the local municipality generally has planning jurisdiction. Outside the urban planning area, the county has planning jurisdiction. In those urban areas where no urban thoroughfare plan has been developed, elements are generally considered to be rural and under the planning jurisdiction of the county. When a thoroughfare plan is developed for an urban area that has not previously had a plan, then the area defined by that plan would

be considered urban and come under the planning jurisdiction of the municipality.

Within the urban and rural systems, thoroughfare plan elements are classified according to the specific function which they are to perform. A discussion of the elements and functions of the two systems follows:

Urban Thoroughfare Classification System

In the urban thoroughfare plan, elements are classified as either local access streets, minor thoroughfares or major thoroughfares. Due to the limited amount of detail that can be shown on a county thoroughfare plan, only urban major thoroughfares are normally shown. The major thoroughfare system within urban areas can be divided into four categories: radial streets, crosstown streets, loop streets and bypasses (Figure 1).

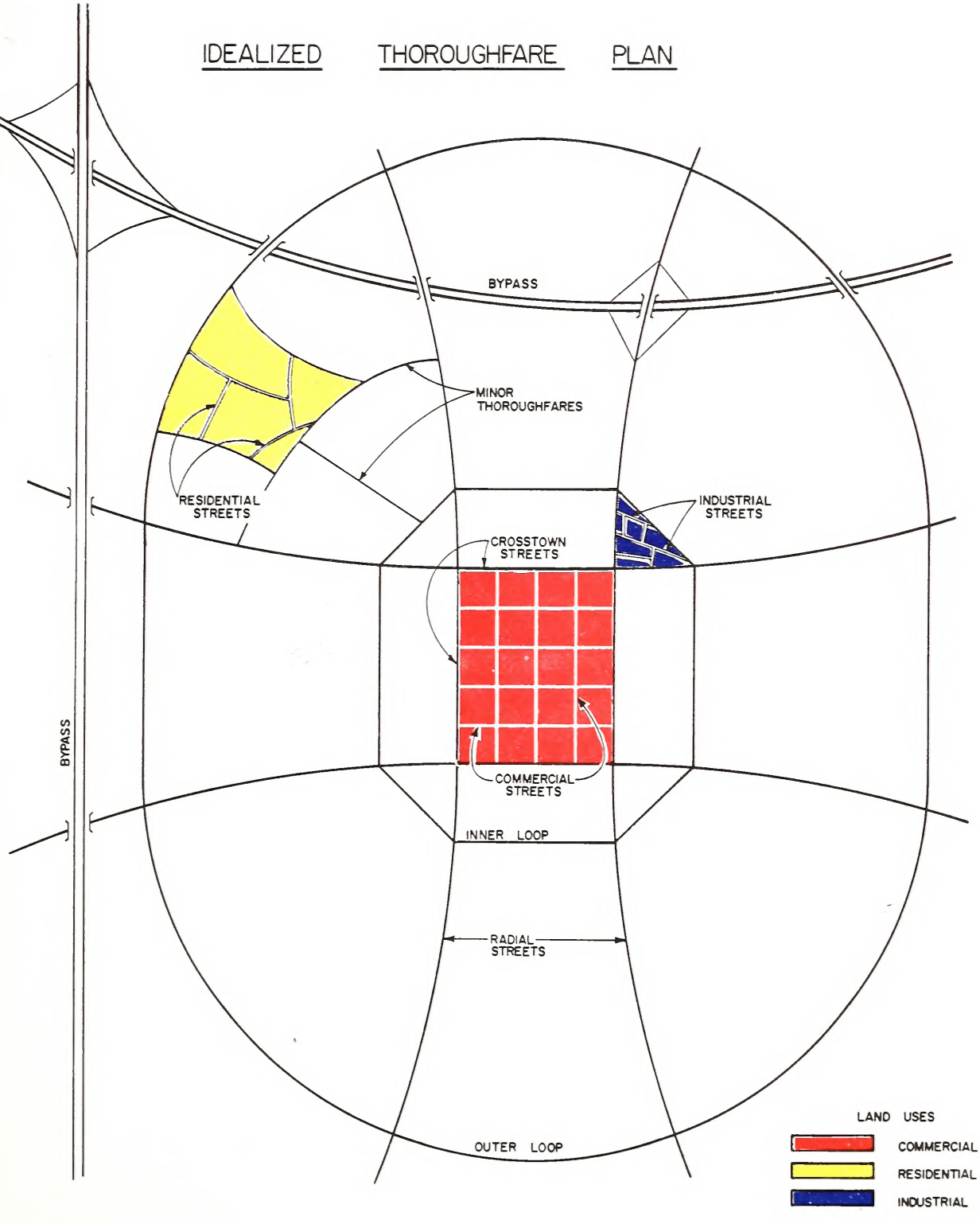
Radial Streets: Radial streets provide for direct traffic movement between the central area and outlying areas. This is a major movement in most cities and the economic strength of the central area depends heavily on the adequacy of the radial thoroughfares.

The Crosstown System: If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of crosstown streets which forms a loop around the central business district. These streets route traffic along the border of the central area as it moves from origins on one side to destinations on the other. The system also allows central area traffic to circle the central area and enter near its destination. The effect of a good crosstown system is to free the central area of crosstown traffic, thus permitting the central area to better function in its role as a pedestrian shopping area.

The Loop System: Loop streets move traffic between suburban areas of the city. Although a loop may completely encircle the city, a typical trip would be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not necessarily carry heavy volumes of traffic, but they function to help relieve central area congestion and shorten travel times between suburban areas. There may be one or more loops, depending on the size of the urban area, and they are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

The Bypass: Bypasses function to carry traffic through or around the urban area. They are usually designed to rural highway standards with control of access. The general effect of the bypass is to expedite the movement

FIGURE 1


IDEALIZED THOROUGHFARE PLAN
BYPASS
MINOR THOROUGHFARES
RESIDENTIAL STREETS
INDUSTRIAL STREETS
CROSSTOWN STREETS
COMMERCIAL STREETS
INNER LOOP
RADIAL STREETS
OUTER LOOP
BYPASS
LAND USES
COMMERCIAL
RESIDENTIAL
INDUSTRIAL

of through traffic and to lessen traffic congestion within the city. Occasionally a low traffic volume bypass can be designed to function as a portion of an urban loop.

Rural Arterial Classification System

The rural system consists of those facilities outside the urban thoroughfare planning area boundaries. They are classified into four major systems: principal arterials, minor arterials, major and minor collector roads, and local roads. Table 1 indicates generally accepted statewide mileage on these systems.

Table 1. Rural System Road Mileage Distribution

Systems	Percentage of Total Rural Miles
Principal arterial system	2-4
Principal arterial system plus minor arterial road system	6-12
Collector (major plus minor) road system	20-25
Local road system	65-75

Figure 2 gives a schematic illustration of a functionally classified rural highway system.

Rural Principal Arterial System: The rural principal arterial system consists of a connected network of continuous routes which serve corridor movements having trip lengths and travel density characteristics indicative of substantial statewide or interstate travel. The principal arterial system should serve all urban areas of over 50,000 population and a large majority of those with a population greater than 5,000. The Interstate System constitutes a significant portion of the principal arterial system.

Rural Minor Arterial System: The minor arterial system in conjunction with the principal arterial system forms a network which links cities, larger towns, and other major traffic generators such as large resorts. The minor thoroughfare system generally serves interstate and intercounty travel and serves travel corridors with trip lengths and travel densities somewhat less than the principal arterial system.

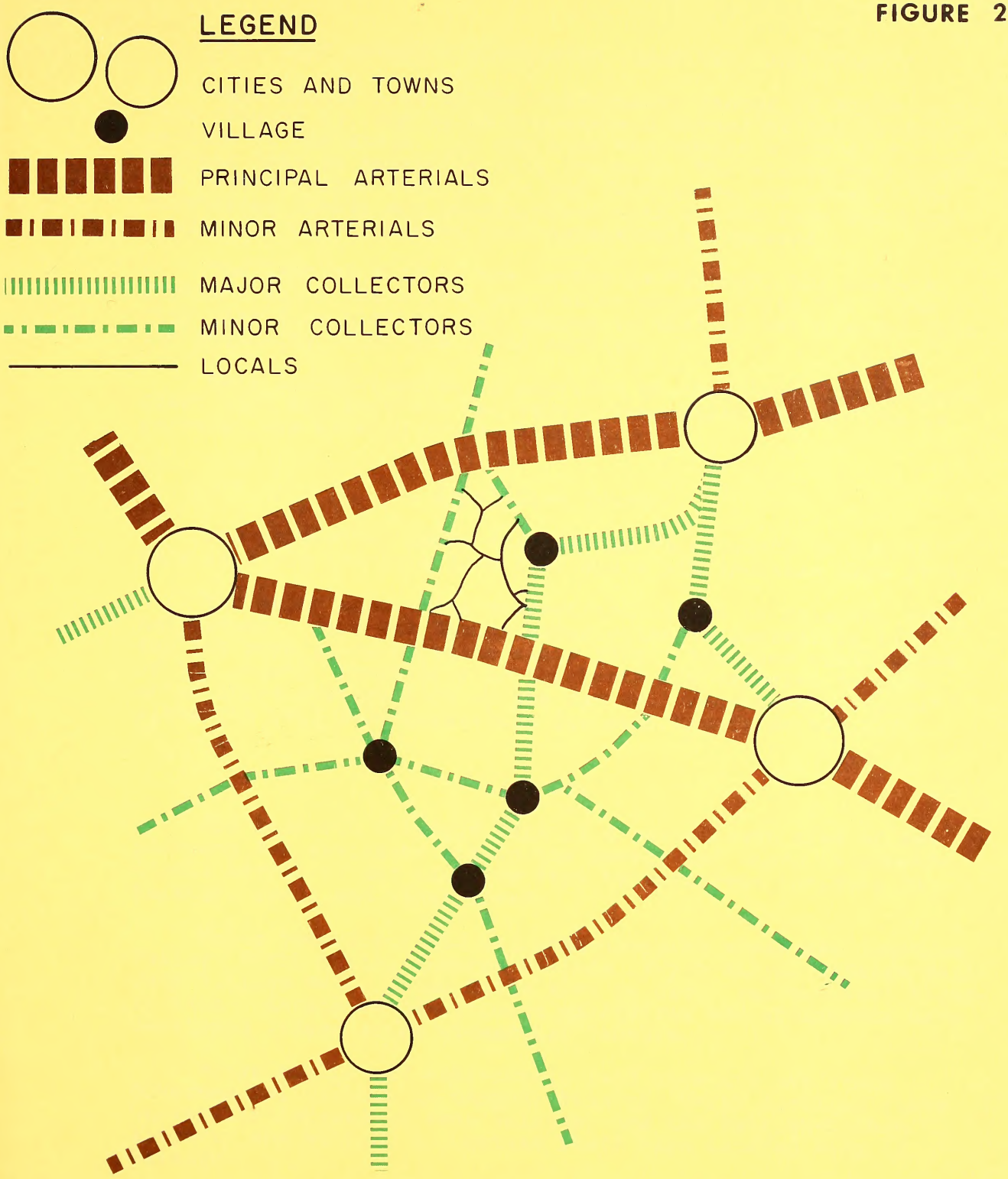
Rural Collector Road System: The rural collector routes generally serve travel of primarily intracounty rather than statewide importance and constitute those routes on which predominant travel distances are shorter than on the arterial routes. This system is subclassified into major collector roads and minor collector roads.

Major Collector Roads: These routes (1) provide service to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intracounty importance, such as consolidated schools, shipping points, county parks, important mining and agricultural areas, etc; (2) link these places with nearby larger towns or cities, or with routes of higher classification; and (3) serve the more important intracounty travel corridors.

Minor Collector Roads: These routes (1) collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road; (2) provide service to the remaining smaller communities; and (3) link the locally important traffic generators with their rural hinterland.

Rural Local Road System: The local roads comprise all roads not on one of the higher systems.

FIGURE 2



SCHEMATIC ILLUSTRATION
OF FUNCTIONALLY CLASSIFIED
RURAL HIGHWAY NETWORK

III. WAKE COUNTY - POPULATION, LAND USE, AND TRAFFIC

Wake County lies in the approximate center of North Carolina (Figure 3), and is on the eastern border of the Piedmont section of the state. It contains 864 square miles of rolling terrain that is generally well drained. The elevation across the county varies from 140 to 545 feet above sea level. The cultivated fields are interspersed with forest pine and hardwoods, all of which have been extensively lumbered.

The largest city in the county is Raleigh, the state's capital, which has a 1980 population count of 149,771. The city itself is historically unique in that it was planned from its beginning to be the state capital.

Rail transportation is provided to the county by Seaboard Coast Line and Southern Railways. Commercial air service is provided via Raleigh Durham Airport.

Population Trends

The population count for 1980 in Wake County is 300,833. This is a 78% increase from 1960 and a 31% increase from 1970.

The major population concentrations are in Raleigh, Cary, and Garner. Cary and Garner experienced an incredible 183% and 94% population increase since 1970. The once rural areas of the county, especially to the north are expected to grow at an above average rate in the future. Recent projections* place the year 2000 population for Wake County at 447,237.

Land Use

The Research Triangle Park is a significant area of employment for residents within the county and there is considerable travel to and from the Park by employees residing in Raleigh, Cary, and other areas.

Major commercial and regional shopping areas are Crabtree Valley, North Hills, Cameron Village, Tryon Hills, Raleigh Mall, Cary Village Mall, South Hills also in Cary, and proposed Regency Park. Extensive development of offices and apartments have developed around these commercial centers.

Major public and semi-public land uses are the State Governmental Offices in central Raleigh, North Carolina State University located in west Raleigh, and the Raleigh-Durham Airport, and William B. Umstead State Park located west of Raleigh.

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*Projections were provided by the North Carolina Department of Administration.

The Towns of Cary and Garner have long functioned as bedroom type communities to Raleigh with people residing in these two towns and working in Raleigh. The Towns of Wake Forest, Fuquay Varina, Apex, Wendell, and Zebulon have also tended in this direction. More recently, industrial development has begun to develop along the transportation corridors between Raleigh and the outlying towns. Examples are Shearon Harris Nuclear Power Plant, Mini City, and the Wakefield Farm Industrial Park. This later trend has mitigated somewhat the trend toward the development of the outlying towns as primarily bedroom communities.

The Raleigh-Cary-Garner urban area has experienced a rapid and accelerating urban growth during the past decade. There has also been a noted trend toward the development of a multi-centered urban area. There is no indication that these trends will be altered in the foreseeable future.

The rapid urban growth and extensive development along travel corridors between the Raleigh-Cary-Garner urban area and the outlying towns will place an increasingly heavy burden on radial highways during the design period.

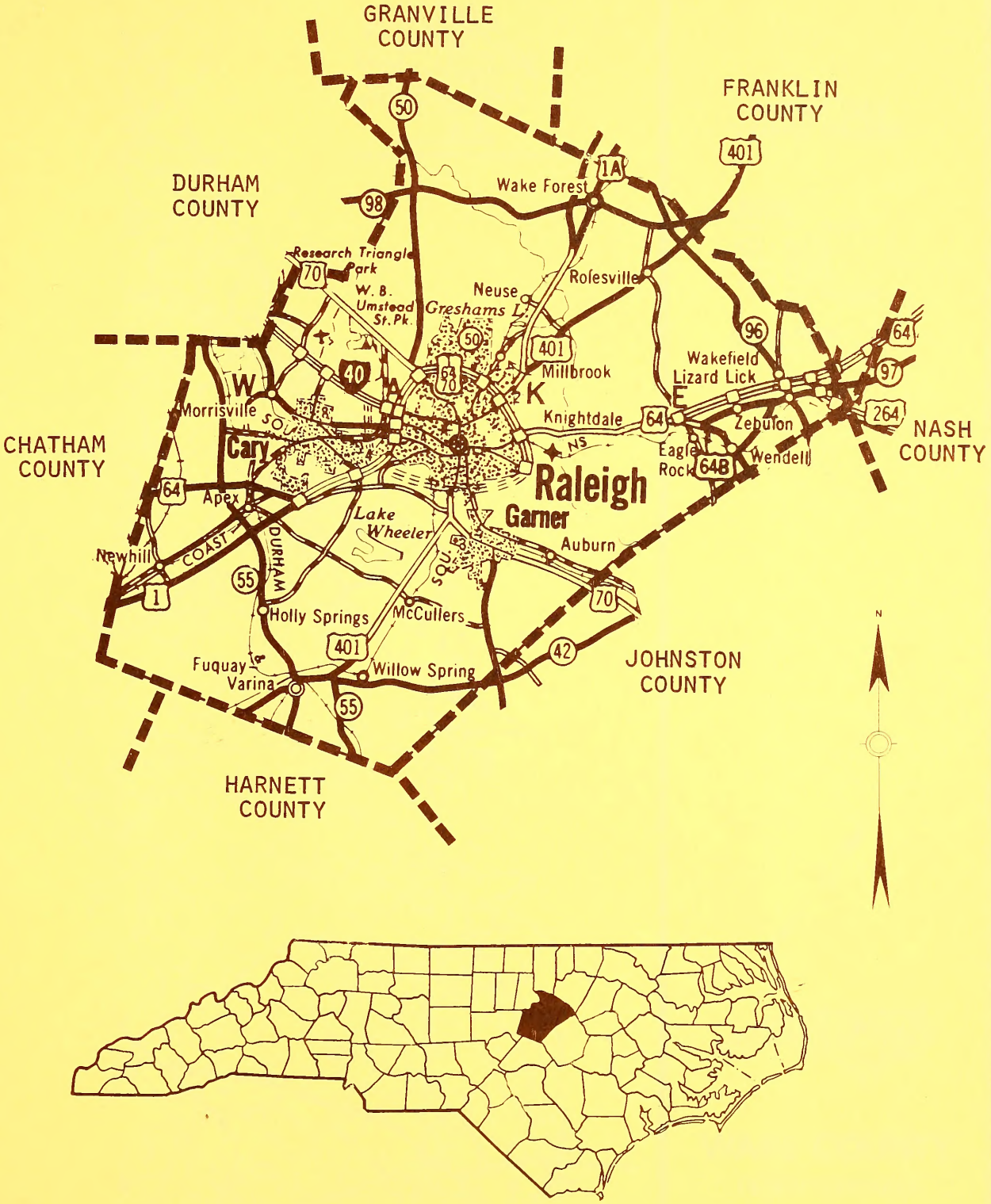
Traffic

A comparison of 1969, 1974, and 1979 average annual daily traffic volumes (ADT) on selected major highways in Wake County are shown in Figure 4. On the average, the ADT's doubled in the ten year period throughout the county. Historically in North Carolina ADT's double over a twenty year period. So Wake County is experiencing a significant growth rate in traffic volumes.

Motor vehicle registrations in Wake County for 1969, 1974, and 1979 are given in Table 2.

Table 2. Vehicle Registrations

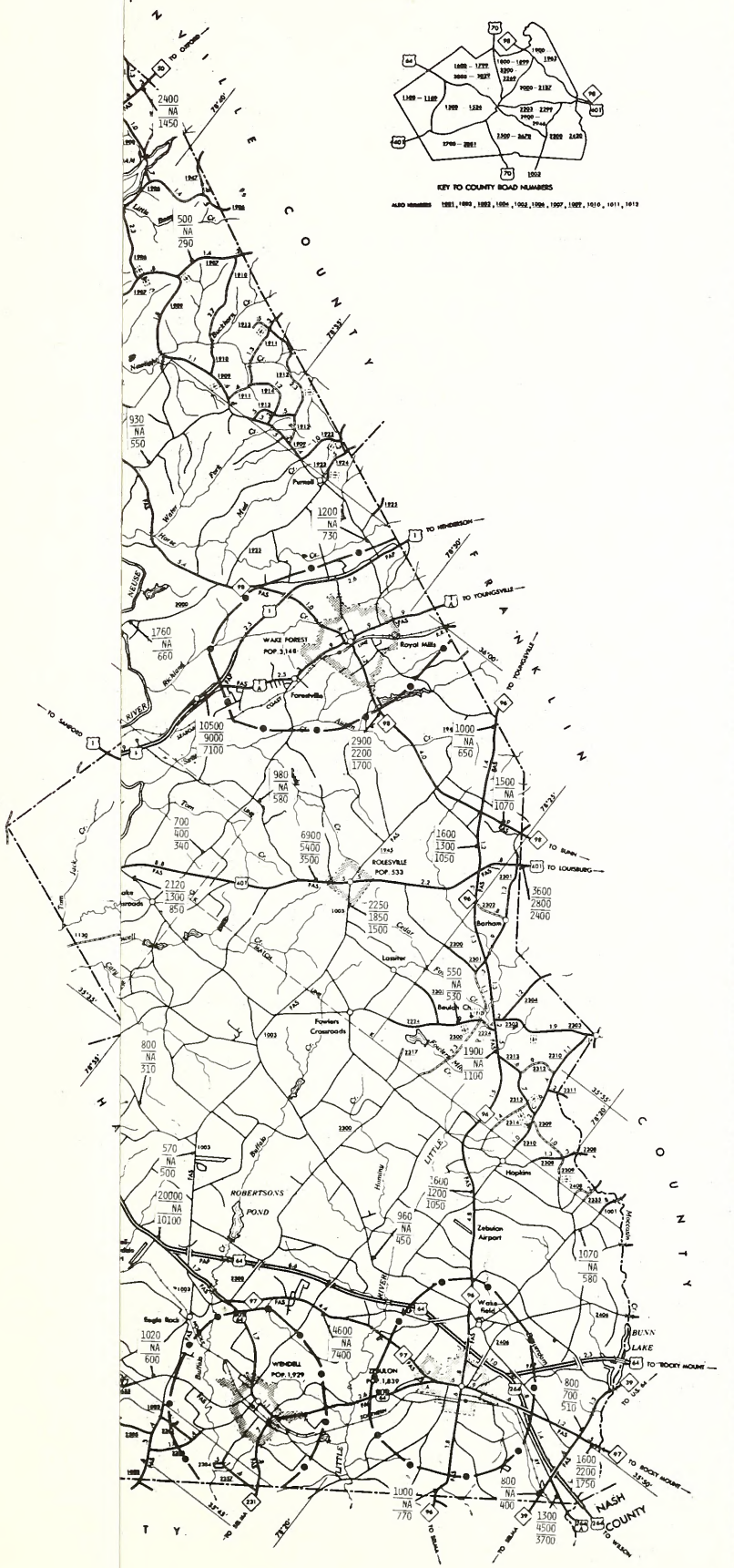
Year	1969	1974	1979
Autos	110,136	159,179	202,642
Trucks	35,321	44,168	54,633
Total	145,457	203,347	257,275



GEOGRAPHIC LOCATION

FIGURE 3

FIGURE 4

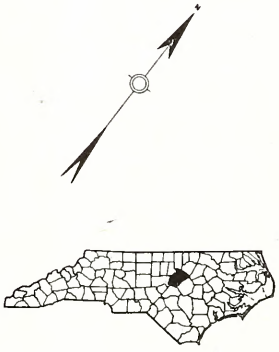


AVERAGE DAILY TRAFFIC VOLUMES

LEGEND:

YEAR ADT VOLUME
1979 = 00000
1974 = 00000
1969 = 00000
NA = NOT AVAILABLE

URBAN PLANNING CORDON —•—•—



WAKE COUNTY
NORTH CAROLINA

SCALE

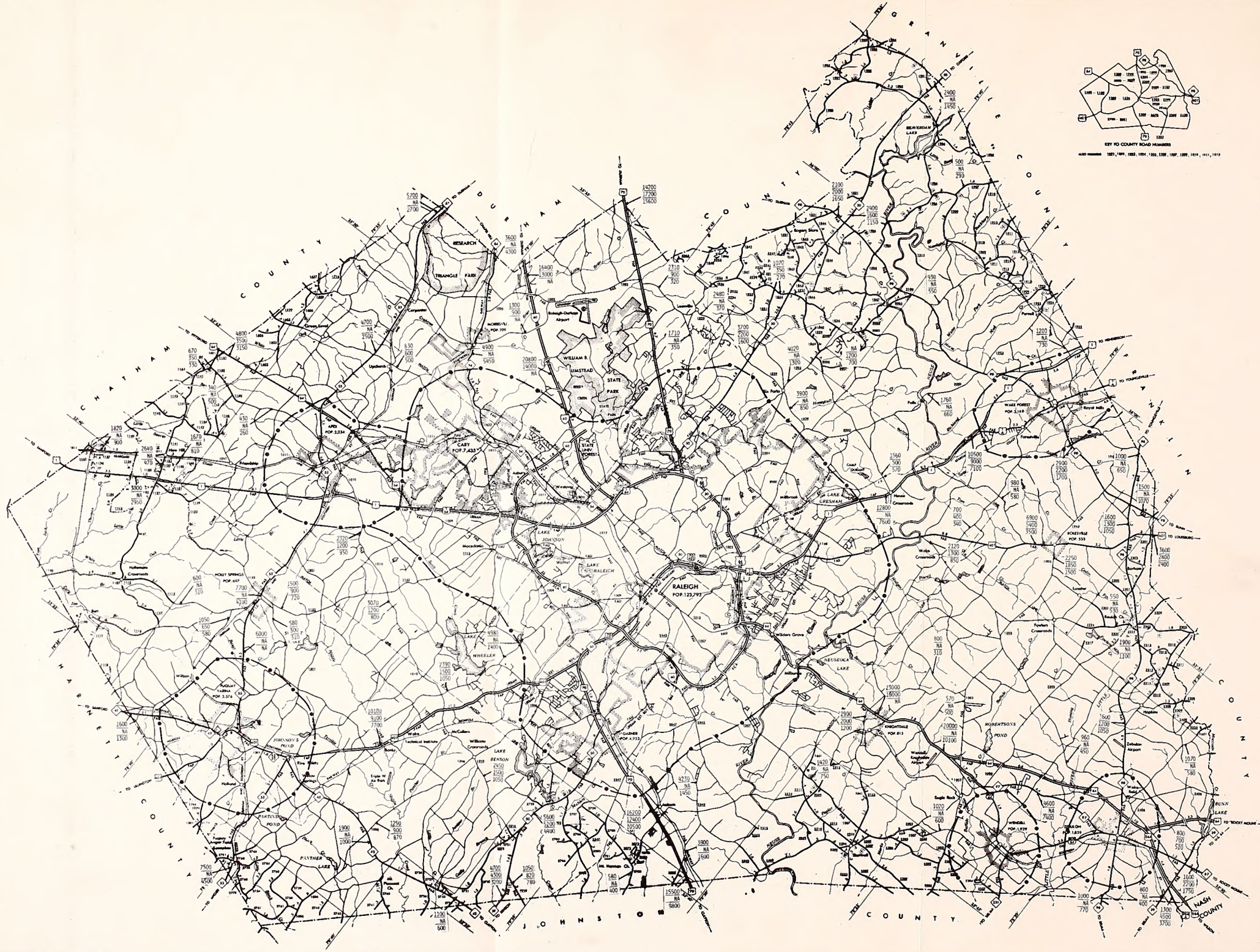
FIGURE 4

AVERAGE DAILY TRAFFIC VOLUMES

LEGEND:

YEAR ADT VOLUME
1979 = 00,000
1974 = 00,000
1969 = 00,000
NA = NOT AVAILABLE

URBAN PLANNING CORDON —•—•—



WAKE COUNTY
NORTH CAROLINA

SCALE

Auto registrations in Wake County increased at an above average rate of 84% over the ten year period, while truck registrations increased 55% which is about the state average.

On the basis of the past trends examined in this chapter: population, land use, ADT counts, and vehicle registrations, it appears Wake County will experience considerable increases in traffic volumes during the 1980-2000 planning period.

As a result of this growth, it was deemed necessary to estimate traffic volumes for the year 2000, so that the road system in the county could be analyzed as to its ability to maintain adequate service. Projected volumes for critical highway sections appear in Table 3.

The volumes were developed initially by using linear regression analysis on the historic ADT trends. They were then compared on a township level to expected population growth, anticipated land use (commercial and residential), and forecasted vehicle registrations. The straight line projections were then adjusted, as a result of the comparison, to reflect a more representative volume.

Table 3

Historical and Projected Annual Average Daily Traffic Volumes for Selected Locations On The Wake County Highway System

Location	1969	1974	1979	2000[a]
I-40 at Durham County	NA	13,000	16,400	30,000
US 70 at Durham County	15,600	17,200	14,200	23,000
US 70 at Turkey Creek	NA	NA	19,700	31,000
US 70 at Johnston Creek	9,800	NA	15,500	23,000
US 64 at Chatham County	3,200	3,500	4,800	7,000
US 64 at SR 2516 (Hodge Rd.)	13,000	NA	23,100	43,000
US 64 at US 64 Bus. (Wendell)	10,100	NA	20,000	38,000
US 401 at Middle Creek	7,700	9,100	10,100	16,000
US 401 at SR 2766	11,100	13,100	20,800	35,000
US 401 at Rolesville	3,500	5,400	6,900	13,000
US 1 at SR 1134 (Horton Rd.)	2,950	NA	3,000	7,000
US 1 at Marshall Village	7,100	9,000	10,500	23,800
NC 54 at Durham County	4,300	NA	3,600	4,000
NC 55 at Durham County	2,700	NA	5,100	10,000
NC 55 at Apex Planning Cordon	2,800	3,700	5,000	10,000
NC 42 at SR 1006 (Old Stage Rd.)	1,100	NA	1,900	4,000
NC 50 at Johnston County	3,200	4,300	4,700	3,000

Table 3 (continued)

Location	1969	1974	1979	2000[a]
NC 50 at SR 1829 (Strickland Rd.)	1,600	2,200	3,700	7,000
NC 50 at Granville County	1,450	NA	2,400	4,000
NC 98 at Durham County	1,650	2,000	2,100	3,000
NC 98 at Wake Forest Planning Cordon	1,700	2,200	2,900	4,500
NC 96 at Franklin County	500	NA	1,000	2,500
NC 96 at Johnston County	770	NA	1,000	2,000
NC 97 at SR 2329 (Lizard Lick Rd.)	7,400	NA	4,600	2,000
NC 39 at NC 97	510	700	800	1,300

[a]Estimated
NA Not Available

IV. ANALYSIS OF EXISTING MAJOR ROAD SYSTEM

An assessment of the existing highway network outside the urban planning areas was made to determine if it could adequately handle the traffic demands that are being placed upon it. One phase of this assessment was a volume-capacity analysis. Based on levels of service (operating speeds) and pavement widths, the practical capacities of the major roads in the county were determined (Appendix A). When the existing volumes (Figure 4) were compared to those capacities, it was found that the following roads in the county were experiencing capacity problems:

1. US 401 from SR 2042 (Fox Rd.) to SR 2224 (Mitchell Mill Rd.)
2. NC 50 from SR 2562 (New Rand Rd.) to SR 1010 (Old NC 42)
3. NC 55 between Apex and Fuquay

The estimates of year 2000 traffic (Table 3) were then compared to the practical capacities to determine future deficiencies. It is anticipated that the following sections of roads will be over capacity by the design year (2000).

1. US 1
   From Apex Planning Cordon to Chatham County
2. US 64
   From Chatham County to NC 55
   From the Neuse River to SR 2233 (Wade Harris Rd.)
3. US 64 Business
   From Wendell Planning Cordon to SR 2348 (Oil Mill Rd.)
4. US 401
   From SR 2042 (Fox Rd.) to Franklin County
5. NC 50
   From Raleigh Planning Cordon to NC 98
6. NC 54
   From north Morrisville city limits to SR 1762 (Wilson Rd.)
7. NC 55
   Durham County to Harnett County
8. NC 98
   From SR 1917 (Harrison Rd.) to SR 1928
9. SR 1005 (Six Forks Rd.)
   From Raleigh Planning Cordon to NC 98
10. SR 1006 (Old Stage Rd.)
    From SR 2711 (Bud Buffaloe Rd.) to Williams Crossroads
11. SR 1007 (Poole Rd.)
    From SR 2636 to SR 2516 (Hodge Rd.)
12. SR 1010 (Old NC 42)
    From SR 1379 (Penny Rd.) to NC 50
13. SR 1371 (Lake Wheeler Rd.)
    From Yates Mill Pond to SR 1375 (Simpkins Rd.)

14. SR 1375 (Simpkins Rd.)
From US 401 to SR 1010 (Old NC 42)
15. SR 1829 (Strickland Rd.)
From SR 2000 (Falls of the Neuse Rd.) to Leesville
16. SR 2000 (Falls of the Neuse Rd.)
SR 1829 (Strickland Rd.) to NC 98
17. SR 2215 (Buffaloe Rd.)
From SR 2931 to SR 2217 (Allen Store Rd.)

There are a number of major roads in the county that have widths of 16 and 18 feet. Standards established by the American Association of State Highway and Transportation Officials (AASHTO) set 20 feet as a minimum width with 24 feet as a preferred width. However, because of the substantial cost of upgrading all secondary roads to AASHTO standards, narrower widths are tolerated depending upon traffic volumes (see Table 5, page 36). The roads on the thoroughfare plan that have inadequate and intolerable width deficiencies are listed in Appendix A. The minimum widths needed to bring them in line with tolerable AASHTO standards are given as recommended cross sections.

Traffic Safety

Traffic accident records are of assistance in locating problem areas on the highway system. The Traffic Engineering Branch of the North Carolina Department of Transportation publishes each year a safety program listing. In 1979 the list contained the 677 highest accident locations in the state. A ranking of one is the most hazardous location whether by number of accidents or severity of injuries or property damage. The following is a list of high accident locations in Wake County and their rank in the state.

General Location	Priority Number
SR 1010 at SR 1300	4
NC 50 at SR 1829 (Strickland Rd.)	14
SR 1006 at SR 2717	16
US 401 at NC 42-55-SR 2795	82
US 1 at SR 2006	110
US 1 at SR 2013	119
US 70 at SR 2558	126
SR 1009 at SR 1348	159
US 70 at SR 2555	235
US 401 at SR 2782	237
US 64 at SR 2233	263
US 70-NC 50 at SR 2538-2623	268
NC 54 at SR 1664	281
US 70-401-NC 50 at SR 1370-2623	332
US 401 at SR 2538	340
US 64 (Beltline) at US 64 (New Bern Ave.)	394
US 64 at SR 2049	466
US 1 at SR 2108 (New Hope - Millbrook Rd.)	480
US 70-NC 50 at SR 2788	650

BRIDGE CONDITIONS

Bridges are a vital and unique element of a highway system. First, they represent the highest unit investment of all elements of the system. Second, any inadequacy or defect in a bridge reduces the value of the total investment. Third, a bridge presents the greatest opportunity of all potential highway failures for disruption of community welfare. Finally, and most important, a bridge represents the greatest opportunity of all highway failures for loss of life. For these reasons it is imperative that bridges be constructed to the same design standards as the system of which it is a part.

In 1975 the North Carolina General Assembly initiated a special fund for a State Bridge Replacement Program. Five million dollars per year have been budgeted for this purpose since 1975. Related legislation directed the Department of Transportation to replace or remove from the highway system all through truss bridges with spans over 125 feet in length and roadway widths of less than 12 feet. Thus, bridges of this type were assigned high priority in the development of this program.

With nearly all of the narrow truss bridges replaced or identified for removal, the new thrust of the program has been directed toward improving the state bridges with posted load restrictions. These restrictions require buses to unload before crossing and in some cases they must be rerouted requiring substantial additional travel.

Bridges selected for replacement under this program represent the most critical statewide needs as they have been identified at this time. Also, the Governor's Blue Ribbon Commission appointed to assess the state's transportation needs and financing, just recently, recommended the following design standards for bridge replacement:

Arterial Bridges

> Replace or rehabilitate all bridges with a width less than the approach pavement width plus 8' or posted less than legal load limit.

Collector Bridges

> Replace or rehabilitate all bridges with a width less than the approach pavement width plus 4' or posted less than legal load limit.

Local Bridges

> Replace or rehabilitate all bridges with a width of 16' or less or unable to serve school buses.

The bridges in Wake County that do not meet these standards are listed below.

	Route	Feature Intersected
1.	US 64 Business	Little River
2.	NC 97	Moccasin Creek
3.	SR 1001	Moccasin Creek
4.	SR 1005	Upper Barton's Creek
5.	SR 1006	Swift Creek
6.	SR 1006	Middle Creek
7.	SR 1006	Black Creek
8.	SR 1007	Poplar Creek
9.	SR 1010	Norfolk Railway
10.	SR 1101	Norfolk and Southern Railroad
11.	SR 1115	Cary Branch
12.	SR 1127	Little White Oak Creek
13.	SR 1153	Little Branch Creek
14.	SR 1160	Prong Beaver Creek
15.	SR 1301	Middle Creek
16.	SR 1375	Middle Creek
17.	SR 1375	Swift Creek
18.	SR 1379	Swift Creek
19.	SR 1393	Bassal Creek
20.	SR 1613	Crabtree Creek
21.	SR 1615	Durham and Southern Railway
22.	SR 1839	Sycamore Creek
23.	SR 1909	Horse Creek
24.	SR 1942	Smiths Creek
25.	SR 2006	Branch Creek
26.	SR 2006	Perry Creek
27.	SR 2049	Reedy Creek
28.	SR 2049	Smiths Creek
29.	SR 2049	Tom Creek
30.	SR 2217	Beaverdam Creek
31.	SR 2320	Buffalo Creek
32.	SR 2329	Hominy Creek
33.	SR 2352	Little River
34.	SR 2751	Terrible Creek

V. THOROUGHFARE PLAN

The recommended thoroughfare plan for Wake County is shown in Figure 5. Elements of the plan are initially classified as urban or rural. The areas around Raleigh-Cary-Garner, Apex, Fuquay, Wendell, Zebulon, and Wake Forest are delineated as urban thoroughfare planning areas since mutually approved thoroughfare plans are in effect for these municipalities.

Only major thoroughfares classified as to either freeway or other, existing or proposed, are shown within the urban thoroughfare planning areas in Figure 5. This was necessary due to the limited amount of detail that can be shown on the county level.

Principal Arterials

The principal arterial routes in Wake County that will serve primarily interstate and statewide travel are as follows:

1. I-40 - Including the proposed Raleigh to Benson connector
2. US 1 - Sections not already four-laned[1] will need to be widened by the year 2000 from NC 55 to the Chatham County line.
3. US 64 - The section from Knightdale to the Neuse River should be widened to 6 lanes and the section from NC 55 to the Chatham County line will need to be four-laned.
4. US 64 - US 64 New location. From US 64 Business near Wendell to Raleigh southern Beltline at SR 2544 (Sunnybrook Rd.).
5. US 70 - From proposed I-40 (to Benson) to the Johnston County line.
6. Proposed Outer Loop.
7. US 264

Minor Arterials

The minor arterials in conjunction with the principal arterial system form a network which links the cities and larger towns of the region. The minor arterial routes that are included in the plan are as follows:

1. US 70 - West of Raleigh.
2. US 401 - From Raleigh to Harnett County via proposed US 401 Bypass around Fuquay.

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[1]For all the following recommendations, consult Chapter VII and Appendix A for more explicit details.

Collector Road System

The rural collector routes will serve primarily intra-county travel. The major collector roads will supplement the principal arterial and minor arterial systems by providing an interconnecting network between smaller population centers and connecting the smaller population centers to the arterial routes. The minor collector roads will collect traffic from the local roads and carry it to the higher system roads. Proposed major and minor collector roads of Wake County are as follows:

Major Collector Roads

1. US 64 Business - From US 64 to Wendell Planning Area and from Wendell Planning Cordon at Little Creek to Zebulon Planning Cordon at SR 2348 (Oil Mill Rd.). The latter section will need four lanes.
2. US 264A - From Zebulon Planning Cordon to Johnston County.
3. US 401 - From Raleigh Planning Cordon to Franklin County, and from Fuquay Planning Cordon to Harnett County. Four lanes will be required from SR 2042 (Fox Rd.) to Franklin County Line.
4. NC 39 - From Franklin County to Johnston County.
5. NC 42 - From Johnston County to Harnett County minus Fuquay Planning Area.
6. NC 50 - The section from Strickland Rd. (SR 1829) to NC 98 will need to be 4-laned.
7. NC 54 - From Durham County to Raleigh Planning Cordon at SR 1762 (Wilson Rd.). The section from the north Morrisville city limits to Wilson Rd. will need four lanes.
8. NC 55 - From Durham County to Harnett County minus the Apex and Fuquay planning areas. The entire route will be over capacity and need four lanes.
9. NC 96 - From Franklin County to SR 2337 (John Borrow Rd.) and from Zebulon Planning Cordon at Johnston County.
10. NC 97 - From US 64 Bus. to Franklin County minus Zebulon Planning Area.
11. NC 98 - Four lanes will be needed from SR 1917 (Harrison Rd.) to the proposed NC 98 bypass in Wake Forest.
12. SR 1003 (Eagle Rock Rd.) From US 401 to Johnston County.
13. SR 1004 (Old US 70) - From Raleigh Planning Cordon at SR 2560 (Auburn Rd.) to Johnston County.
14. SR 1005 (Six Forks Rd.) - From SR 1829 (Strickland Rd.) to Raleigh Planning Cordon. The section from SR 1829 to SR 2016 (Hawkins Rd.) will require 4 lanes.
15. SR 1007 (Poole Rd.) - From Wendell Planning Cordon at SR 1003 (Eagle Rock Rd.) to Raleigh Planning Cordon at SR 2636. The section from Hodge Rd. to US 64 will require four lanes. A new two lane section is proposed from SR 1003 to SR 2049 (Forestville Rd.).

THOROUGHFARE PLAN

MAY 27, 1981

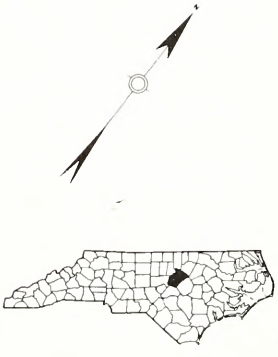
LEGEND

	EXISTING	PROPOSED
PRINCIPAL ARTERIALS		
INTERSTATE		
OTHER		
MINOR ARTERIALS		
MAJOR COLLECTORS		
MINOR COLLECTORS		
URBAN MAJOR THOROUGHFARE		
URBAN FREEWAY OR EXPRESSWAY		
URBAN THOROUGHFARE PLANNING AREA BOUNDARY		

ADOPTED BY WAKE COUNTY COMMISSIONERS ON _____

RECOMMENDED APPROVAL BY PLANNING AND RESEARCH BRANCH ON _____

ADOPTED BY N. C. BOARD OF TRANSPORTATION ON _____



WAKE COUNTY

NORTH CAROLINA

SCALE

1 0 1 2 3 4 MILES

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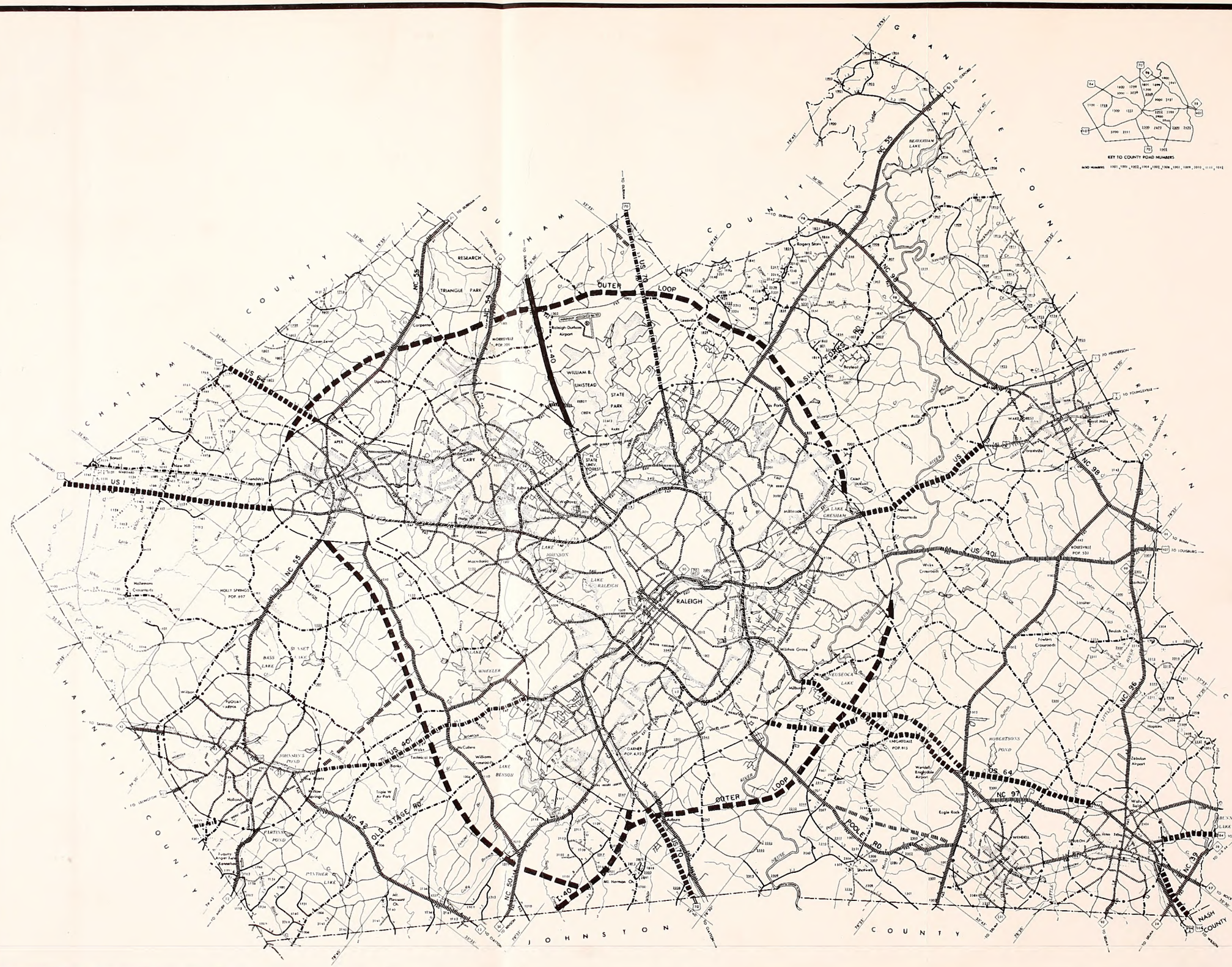
15. SR 1007 (Poole Rd.) - From Wendell Planning Cordon at SR 1003 (Eagle Rock Rd.) to Raleigh Planning Cordon at SR 2636. The section from Hodge Rd. to US 64 will require four lanes. A new two lane section is proposed from SR 1003 to SR 2049 (Forestville Rd.).



THOROUGHFARE PLAN

MAY 27, 1981

LEGEND

	EXISTING	PROPOSED
PRINCIPAL ARTERIALS		
INTERSTATE		
OTHER		
MINOR ARTERIALS		
MAJOR COLLECTORS		
MINOR COLLECTORS		
URBAN MAJOR THOROUGHFARE		
URBAN FREEWAY OR EXPRESSWAY		
URBAN THOROUGHFARE PLANNING AREA BOUNDARY		

ADOPTED BY WAKE COUNTY COMMISSIONERS ON _____

RECOMMENDED APPROVAL BY PLANNING AND RESEARCH BRANCH ON _____

ADOPTED BY N.C. BOARD OF TRANSPORTATION ON _____

WAKE COUNTY

NORTH CAROLINA

SCALE

16. SR 1010 (Old NC 42) - From Apex Planning Cordon at SR 1379 (Penny Rd.) to Johnston County.
17. SR 1371 (Lake Wheeler Rd.) - From Raleigh Planning Cordon at SR 1379 (Penny Rd.) to SR 1375 (Simpkins Rd.). This section will require four lanes.
18. SR 1375 (Simpkins Rd.) - From US 401 to SR 1010 (Old NC 42). Four lanes will be required here.
19. SR 1652 (N. Harrison Rd.) - From Raleigh Planning Cordon to William B. Umstead State Park entrance. Four lanes will be needed.
20. SR 1829 (Strickland Rd.) - From SR 2000 (Falls of the Neuse Rd.) to NC 50. This section will require five lanes.
21. SR 1923 (Thomson Mill Rd.) - Relocate on 4-lane section to connect SR 2000 & NC 98.
22. SR 1945 (Mitchell Rd.) - From NC 98 to US 401.
23. SR 2000 (Falls of the Neuse Rd.) - From SR 1829 to Raleigh Planning Cordon. The section from SR 1829 to SR 2016 will need 4 lanes.
24. SR 2406 - From Zebulon Planning Cordon to Franklin County.
25. Proposed connector from proposed outer loop to proposed US 401 bypass around Fuquay. This connector and the outer loop will serve as a NC 55 relocation.
26. Proposed Southern Parkway. From Durham County at South Square to US 70.
27. Proposed industrial access near Wake Forest. A two lane road is proposed on 4-lane right-of-way between SR 2000 and US 1.

Minor Collectors

1. SR 1001 (Wakefield Rd.) - From Zebulon Planning Cordon to Franklin County.
2. SR 1002 (Airport Rd.) - From SR 3015 to proposed Outer Loop.
3. SR 1005 (Six Forks Rd.) - From SR 1829 to NC 98. This section will require four lanes.
4. SR 1006 (Old Stage Rd.) - From Raleigh Planning Cordon at SR 2711 (Bud Buffaloe Rd.) to Johnston County. The section SR 2711 to SR 1010 (Old NC 42) will require four lanes.
5. SR 1011 (Old US 1) - Apex Planning Cordon to Chatham County.
6. SR 1100 (Wagstaff Rd.) - From Fuquay-Varina Planning Cordon at railroad tracks to SR 1101 (Wilburn Rd.).
7. SR 1101 (Wilburn Rd.) - From SR 1100 to SR 1115 (Hollemans Crossroad Rd.).

8. SR 1110 (Maynard) - From Fuquay-Varina Planning Cordon at railroad tracks to Wilbon.
9. SR 1115 (Hollemans Crossroad Rd.) - From Holly Springs to Hollemans Crossroads.
10. SR 1127 (Welfare Rd.) - From Hollemans Crossroads to New Hill.
11. SR 1141 (New Hill Rd.) - From New Hill to Chatham County.
12. SR 1152 (Holly Springs Rd.) - From Raleigh Planning Cordon at Swift Creek to SR 1153 (Old Holly Springs) at Apex.
13. SR 1153 (Old Holly Springs) - From SR 1152 to Apex Planning Cordon. This is a dirt road that will need to be paved.
14. SR 1160 (Hunter St.) - From Apex Planning Cordon at Beaver Creek to Chatham County.
15. SR 1300 (Kildare Farm Rd.) - From Cary Planning Cordon at Swift Creek to SR 1379 (Penny Rd.).
16. SR 1301 (Sunset Lake) - From Harnett County to Fuquay-Varina Planning Cordon.
17. SR 1301 (Sunset Lake) - From SR 1393 to SR 1152.
18. SR 1375 (Lake Wheeler Rd.) - From SR 1010 to SR 1393 (Bass Lake Rd.).
19. SR 1379 (Penny Rd.) - From SR 1382 to S 1010. Five lanes will be needed from SR 1382 to Lake.
20. SR 1381 (Yates Mill Rd.) - From SR 1379 (Penny Rd.) to Raleigh Planning Cordon at SR 1382 (Wilson Rd.).
21. SR 1382 (Wilson Rd.) - From SR 1380 (Avon Atkins Rd.) to SR 1379 (Penny Rd.). Five lanes will be needed.
22. SR 1393 (Bass Lake Rd.) - From US 401 to SR 1152 (Holly Springs Rd.).
23. SR 1611 (Old Jenks Rd.) - From Apex Planning Cordon to NC 55.
24. SR 1613 (Stone Rd.) - From Apex Planning Cordon to SR 3014.
25. SR 1615 (Greenlevel Rd.) - From NC 55 to Raleigh Planning Cordon.
26. SR 1642 (Nelson to Raleigh-Durham Airport) - From Durham County to proposed Outer Loop at SR 1644 via a proposed connector.
27. SR 1822 (Leesville Rd.) - From SR 1837 (Baker Rd.) to Raleigh Planning Cordon at SR 3211.
28. SR 1829 (Strickland Rd.) - From SR 1839 to NC 50.
29. SR 1834 From SR 1829 (Strickland Rd.) to NC 50.
30. SR 1837 (Baker Rd.) - From US 70 to Leesville. Four lanes will be needed.
31. SR 1839 (Bliss Rd.) - From Durham County to SR 1829 (Strickland Rd.).
32. SR 1907 (Newlite Rd.) - From NC 98 to Granville County.
33. SR 1909 (Mason Pond Rd.) - From SR 1917 to Wake Forest Planning Cordon.
34. SR 1917 (Harrison Rd.) - From NC 98 to SR 1909 (Mason Pond Rd.).
35. SR 1942 (Juniper St.) - From Wake Forest Planning Cordon at SR 1943 (Brame Rd.) to Franklin County.

36. SR 2000 (Falls of the Neuse Rd.) - From SR 1829 (Strickland Rd.) to NC 98. This section will require four lanes.
37. SR 2006 (Mt. Vernon Church Rd.) - From SR 1005 (Six Forks Rd.) to US 401.
38. SR 2012 (Litchford Rd.) - From SR 2000 to Raleigh Planning Cordon at SR 2013 (T. Quarry Rd.).
39. SR 2045 (Burlington Mills Rd.) - From US 1 to SR 2049 (Forestville Rd.).
40. SR 2049 (Forestville Rd.) - From Wake Forest Planning Cordon at Austin Creek to US 401 and US 64 to SR 1007.
41. SR 2051 (Burlington Mills Rd.) - From SR 2049 to US 401.
42. SR 2215 (Buffaloe Rd.) - From Raleigh Planning Cordon to SR 2234. The section from the Raleigh Planning Cordon at the Neuse River to SR 2217 will require four lanes.
43. SR 2217 (Allen Store Rd.) - From US 64 to SR 1003 (Eagle Rock Rd.).
44. SR 2224 (Mitchell Mill Rd.) - From US 401 to NC 96.
45. SR 2233 (Wade Harris Rd.) - From US 64 to SR 1007 (Poole Rd.).
46. SR 2234 (Cozart Rd.) - From SR 2215 (Buffaloe Rd.) to SR 1003 (Eagle Rock Rd.).
47. SR 2308 (Fowler) - From SR 2329 to NC 96.
48. SR 2320 (Avon Privette Rd.) - From SR 1003 to NC 97 minus Zebulon Planning Area.
49. SR 2329 (Lizzard Lick Rd.) - From Wendell Planning Cordon to SR 2308 (Fowler).
50. SR 2345 (Loop Rd.) - From Zebulon Planning Cordon to Johnston County.
51. SR 2349 (Morphus Bridge Rd.) - From SR 2352 (Corbin Rd.) to Zebulon Planning Area.
52. SR 2352 (Corbin Rd.) - From SR 2349 to SR 2353 (Morphus Bridge Rd.).
53. SR 2353 (Morphus Bridge Rd.) - From Wendell Planning Area to SR 2352.
54. SR 2358 (Lake Glad Rd.) - From Wendell Planning Cordon at SR 2361 (Old Nowell Rd.) to SR 1003.
55. SR 2516 (Hodge Rd.) - From US 64 to Poole Rd. This section will require four lanes.
56. SR 2542 (Rock Quarry Rd.) - From Raleigh Planning Cordon to SR 2556.
57. SR 2547 (Log Cabin Rd.) - From Raleigh Planning Cordon at SR 2876 to SR 2700.
58. SR 2556 From SR 2542 to SR 1004.
59. SR 2700 (Mt. Herman Church Rd.) - From SR 2547 (Log Cabin Rd.) to Johnston County.
60. SR 2751 (Hilltop Rd.) - From US 401 to NC 42.
61. SR 2754 (Rawl Rd.) - From NC 42 to SR 2765 (Paul Honeycutt Rd.).
62. SR 2765 (Paul Honeycutt Rd.) - From SR 2754 to Fuquay-Varina Planning Cordon.

63. SR 2767 (Sutton Rd.) - From NC 55 to Fuquay-Varina Planning Cordon.
64. SR 2770 (Trash Pile Rd.) - From Harnett County to Fuquay-Varina Planning Cordon.
65. SR 3014 From NC 55 to NC 54.
66. SR 3015 From Morrisville at NC 54 to SR 1002 (Airport Rd.).
67. Proposed Dixie Trail Extension - From Hillsborough St. to SR 1382. It will be five lanes.

Scheduled Improvements To Thoroughfare System

The North Carolina Transportation Improvement Program has been developed and approved by the Board of Transportation, to keep the citizens of North Carolina abreast of current developments in the State's Highway system, to emphasize the ongoing nature of highway planning, and to invite local input into the planning process.

The Program is reviewed and updated by the Board of Transportation on an annual basis, and a seven-year project planning schedule has been established. This sixth annual update in 1979, like the original program, provides an ambitious project schedule. Projects approved by the Board of Transportation and included in the Program represent the highest priority street and highway needs from all across the State as they are currently understood. There are many other greatly needed projects which could not be included and reasonably balance the Program with expected revenues.

The following is a list of projects that are scheduled in the Transportation Improvement Program (TIP) for Wake County:

1. I-40 - Sunnybrook Rd. to S. Saunders St., six lane freeway on new location. (Fiscal year 1981, TIP number I-7)
2. I-40 - NC 54 South to S. Saunders St., four and six lane freeway on new location. (Fiscal year 1980, TIP number I-8)
3. I-40 - Raleigh Beltline to I-95, four lane freeway on new location. (Fiscal year 1980, TIP number I-10)
4. US 1 - US 401 to Wake Forest bypass, widen existing roadway to four lanes. (Under construction, TIP number R-34)
5. US 1 - Richland Creek to Youngsville, widen existing roadway to four lanes. (Fiscal year 1982, TIP number R-205)
6. Apex - SR 1153 (Old Holly Springs), SR 1011 (Old US 1) to town limits, widen to 24 ft. (Under construction, TIP number U-555I)

7. Apex - SR 1307 (Chatham St.) SR 1160 (Hunter St.) to Jones St., widen and resurface. (Fiscal year 1980, TIP number U-655A)
8. Apex - SR 1011 (Salem St.), NC 55 to north Apex city limits, resurface. (Fiscal year 1980, TIP number U-755A)
9. Cary - Harrison Ave., Chatham St. to NC 54, widen existing roadway to multilane facility. (Fiscal year 1982, TIP number U-216)
10. Cary - New Connector Western Blvd., I-40 to SR 1415 (Maynard Rd.), multilane facility on existing roadway. (Fiscal year 1980, TIP number U-505)
11. Cary - Walnut St., US 1 to Maynard Rd., widen existing roadway to multilane facility. (Fiscal year 1985, TIP number U-605)
12. Cary - SR 1101 (Wilburn Rd.) and SR 1616 (High House Rd.), realign intersection. (Fiscal year 1980, TIP number U-755B)
13. Fuquay-Varina - SR 1179 (Bridge St.) south of SR 1110 (Maynard) to Washington St., resurface. (Fiscal year 1980, TIP number U-655E)
14. Fuquay-Varina - SR 2767 (Sutton Rd.), SR 2770 (Trash Pile Rd.) east to Fuquay-Varina city limits, resurface. (Fiscal year 1980, TIP number U-755E)
15. Fuquay-Varina - US 401 and NC 42, change turning radius. (Fiscal year 1980, TIP number U-755F)
16. Garner - Timber Dr., NC 50 to US 70, multilane facility on new location. (Fiscal year 1985, TIP number U-604)
17. Garner - SR 2562 (New Rand Rd.), Main St. to south city limits, widen and resurface. (Fiscal year 1980, TIP number U-655F)
18. Knightdale - SR 2233 (Wade Harris Rd.), SR 2049 (Forestville Rd.) south to Knightdale city limits, resurface. (Fiscal year 1980, TIP number U-755H)
19. Raleigh - Beltline, US 64 to Sunnybrook Road, four-lane freeway on new location. (Fiscal year 1981, TIP number U-63)
20. Raleigh - Dawson-McDowell Streets Ext. to US 401, extend existing roadway. (Fiscal year 1980, TIP number U-83)
21. Raleigh - Halifax St. Wade Ave. Ext., multilane roadway on new location. (Post year, TIP number U-210)
22. Raleigh - Lake Boone Trail, Beltline to SR 1664 (Blue Ridge Rd.) and Blue Ridge Rd., Wade Ave. to Duraleigh Rd., widen to multilane facility. (Fiscal year 1980, TIP number U-514)
23. Raleigh - Hammond Rd., Rush St. to US 70, multi-lane roadway on new facility. (Fiscal year 1982, TIP number U-515)
24. Raleigh - Person-Blount St. Ext., connector to Rush St. (Under construction, TIP number I-7C)
25. Raleigh - Falls of Neuse Rd., Quail Ridge Rd. to north city limits, widen to multilane facility. (Fiscal year 1980, TIP number U-603)

26. Raleigh - SR 1319 (Franklin Rd.), US 1 to Waters Edge Drive, curb and gutter section on east side. (Fiscal year 1980, TIP number U-655 I)
27. Raleigh - SR 1005 (Six Forks Rd.) 0.06 miles north of SR 1819 to city limits, widen and resurface. (Fiscal year 1980, TIP number U-755K)
28. Wake Forest - Elm Ave. and Franklin St., Brooks Ave. to NC 98, extension. (Fiscal year 1980, TIP number U-755)
29. Wake Forest - US 1-A, modify catch basins within Wake Forest. (Fiscal year 1980, TIP number U-755L)
30. Wendell - US 64 Bus., curb and gutter to east town limits. (Under construction, TIP number U-555N)
31. Wendell - SR 2355 (Third St.), SR 1007 (Poole Rd.) to NC 231, resurface. (Fiscal year 1980, TIP number U-655K)
32. Wendell - SR 1007 (Poole Rd.), SR 2355 (Third St.) south to city limits, widen. (Fiscal year 1980, TIP number U-755M)
33. Wendell - NC 231, SR 2355 south to city limits, widen. (Fiscal year 1980, TIP number U-755N)
34. Zebulon - NC 97, SR 2406 to eastern city limits, widen and resurface. (Fiscal year 1980, TIP number U-655L)
35. Zebulon - SR 2348 (Oil Mill Rd.), SR 2349 (Morphus Bridge Rd.) east to NC 96, resurface. (Fiscal year 1980, TIP number U-7550)
36. Raleigh - Peace St., Glenwood Ave. to St. Marys St. and from Halifax St. to Person St., widen to multi-lane facility. (TIP number C 603)
37. Raleigh - Woodburn Ave. - Clark Ave. intersection, provide turn lanes on both streets and upgrade signal. (TIP number C 622)

VI. DESIGN REQUIREMENTS

Design requirements for thoroughfares vary according to the desired capacity and level of services to be provided. Universal standards in the design of thoroughfares are not practical. Each road section must be individually analyzed and its design requirements determined on the basis of amount and type of projected traffic, existing capacity, desired level of service, and available right-of-way.

The level of service is a function of the ease of movement experienced by motorists using the facility. The ability of a motorist to drive at a desired speed is dependent upon the physical design of the road; the amount and character of traffic control devices; the influence and character of traffic generated by abutting property; and imposed speed restrictions. The level of service is generally indicated by the over-all travel speed[1] experienced by traffic. Recommended minimum levels of service for roads and highways included in the proposed Wake County Thoroughfare Plan are given in Table 4.

Table 4. Minimum Levels of Service for Roads and Highways in Wake County

Facility	Overall Travel Speed During Peak Traffic Conditions
Major and Minor Arterials	50-55 MPH
Major Collector Roads	45-50 MPH
Minor Collector Roads	40 MPH

From the standpoint of driver convenience, ease of operation, and safety, it would be desirable to widen all existing roads and highways to provide a minimum lane width of 12 feet. However, when considering overall statewide needs and available highway revenues, it is found that these levels of improvement applied statewide would be impractical. It is necessary, therefore, to establish minimum tolerable widths for existing roads with respect to traffic demands which would be economically feasible. Table 5 gives the widths used in determining the existing lane deficiencies in the county.

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[1]The overall speed is the total distance traveled divided by the total time required, including all traffic delays.

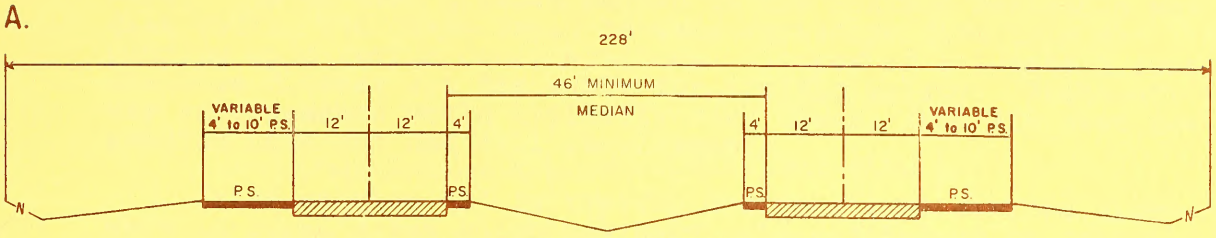
Table 5. Minimum Tolerable Lane Widths (in feet)

ADT	Principal Arterials	Minor Arterials	Collectors
Over 2,000	11	11	11
400-2,000	-	10	10
100- 400	-	10	9
Below 100	-	-	9

Using historic traffic volume trends, information obtained in the capacity deficiency analysis, and tolerable lane width standards, rural road and highway improvements needed in Wake County were defined and are listed in Appendix A. Recommended pavement cross sections for roads to be widened were either 20 feet, 22 feet or 24 feet, depending upon the anticipated traffic and function of the facility. Typical cross sections recommended by the Thoroughfare Planning Unit are shown in Figure 6.

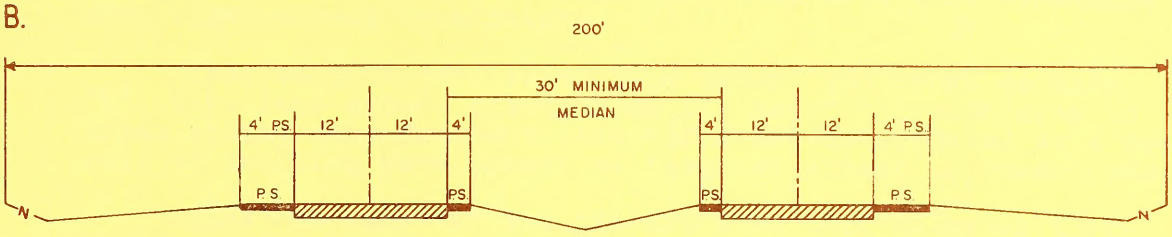
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



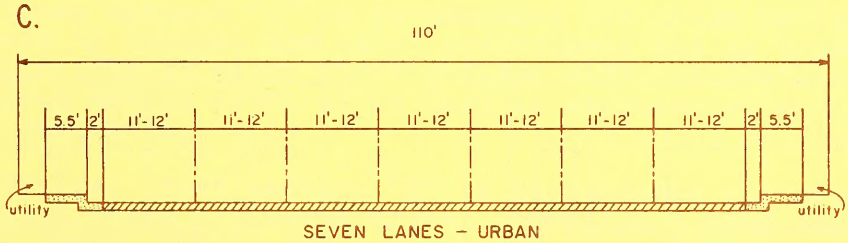
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



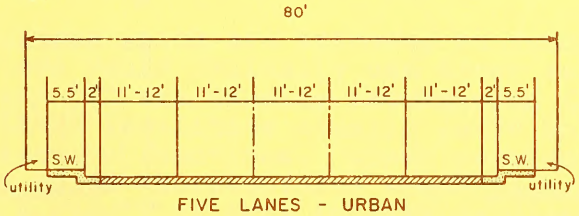
FOUR LANES DIVIDED WITH MEDIAN - RURAL

C.



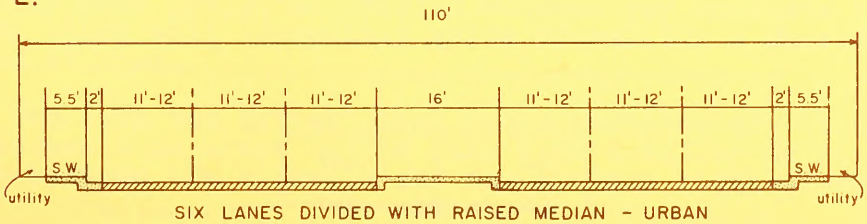
SEVEN LANES - URBAN

D.



FIVE LANES - URBAN

E.

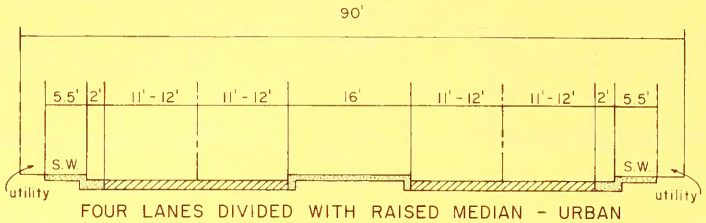


SIX LANES DIVIDED WITH RAISED MEDIAN - URBAN

FIGURE 6

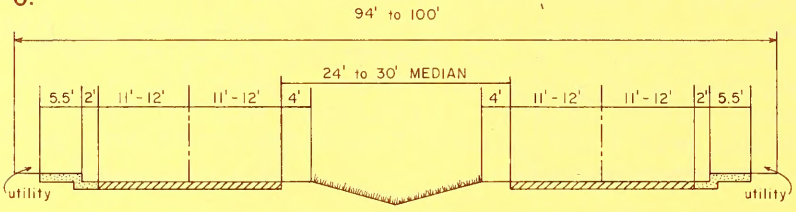
TYPICAL THOROUGHFARE CROSS SECTIONS
(CONTINUED)

F.



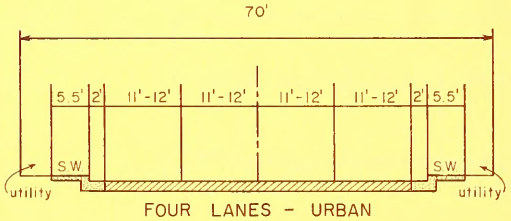
FOUR LANES DIVIDED WITH RAISED MEDIAN - URBAN

G.



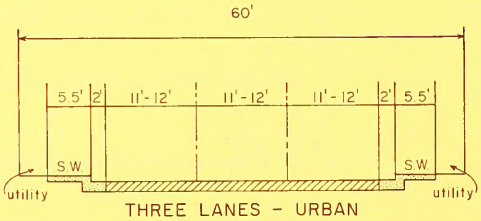
FOUR LANES DIVIDED - URBAN BOULEVARD
GRASS MEDIAN

H.



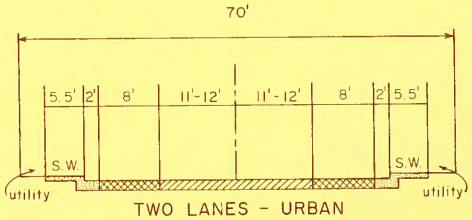
FOUR LANES - URBAN

I.



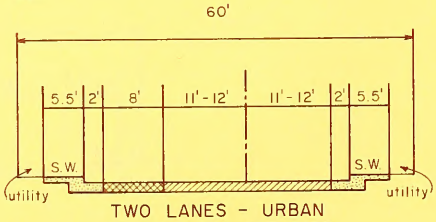
THREE LANES - URBAN

J.



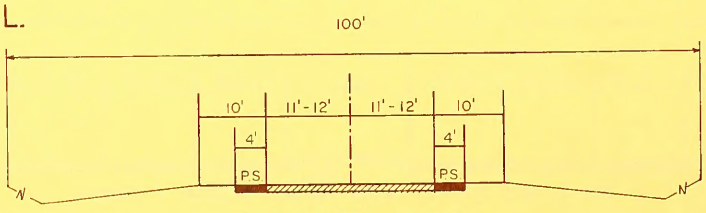
TWO LANES - URBAN
PARKING ON EACH SIDE

K.



TWO LANES - URBAN
PARKING ON ONE SIDE

L.



TWO LANES - RURAL

Cross section "A" is typical for controlled access freeways. The 46 foot grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 228 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares in urban areas where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are also used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes, but is not excessively high; left turning movements are light; and right-of-way is restricted. An additional left turn lane would probably be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically use cross section "I". Cross section "J" and "K" are usually recommended for minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

Cross section "L" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time.

The curb and gutter urban cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line.

This permits adequate setback for utility poles. If it is desired to move the sidewalk further away from the street to provide additional separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

Right-of-ways shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

If there is sufficient bicycle travel along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to contain the bicycle facilities. The North Carolina Bicycle Facility and Program Handbook[1] should be consulted for design standards for bicycle facilities.

Recommended design standards relating to maximum and minimum grades, minimum sight distances, maximum degree of curve and related superelevation, and other considerations for thoroughfares are given in Appendix B. This Appendix gives definitions and design standards recommended for inclusion in subdivision regulations.

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[1]The North Carolina Bicycle Facility and Program Handbook, Barton-Aschman Associates, Inc., April, 1975.

VII. CONSTRUCTION PRIORITIES AND COST ESTIMATES

Recommended priorities for construction or implementation of proposals and their estimated costs (in 1980 dollars) are listed in Table 6. It should be noted that Table 6 is only an estimate and it is flexible. The county and the Department of Transportation should revise the priorities as time progresses to best suit the demands placed on the road system.

Cost estimates for widening of roads to bring them up to AASHTO design standards (Table 5) are also given in Table 6. Priorities for these improvements should be continually monitored by the county and the Division Engineer so that as additional funds become available (Chapter VIII) they can be implemented.

TABLE 6

CONSTRUCTION PRIORITIES AND COST ESTIMATES

PRIORITY AND HIGHWAY SECTION	RECOMMENDED CROSS SECTION	LENGTH OF PROJECT IN MILES	COST ESTIMATES ($1,000) CONSTRUCTION	($1,000) ROW	($1,000) TOTAL
PRINCIPAL ARTERIALS					
1. US 64-Neuse R. to SR 2233	E	3	2,610	0	2,610
2. US 64-Chatham County to 4-Lane Section At NC 55	B	3.5	3,650	1,510	5,160
3. US 1-Chatham County To 4-Lane Section At NC 55	A	8	7,660	0	7,660
4. Outer Loop-US 1 At Gresham's Lake To US 70 At SR 1002	B	12	17,730	12,240	29,970
Outer Loop-US 70 To I-40	D	4	5,850	1,640	7,490
Outer Loop-I-40 To SR 1300	A	16	38,600	18,500	57,100
5. Outer Loop-SR 1300 To Proposed I-40 (To Benson)	A	14	35,810	16,240	52,050
6. Outer Loop-Proposed I-40 to US 1 At Gresham's Lake	A	14	33,810	16,240	50,050
7. US 64 New Location-Beltline To US 64 Business At Wendell	A	10	23,650	7,000	30,650
MINOR ARTERIALS					
1. US 401-Bypass Around Fuquay	L	5	3,700	1,680	5,380
US 401-Bypass At Fuquay Planning Cordon To 4-Lane Section	A	0.5	960	230	1,190
MAJOR COLLECTORS					
1. NC 55-Basal Creek To US 1	B and D	7	4,350	3,100	7,450
2. NC 50-SR 2562 To Johnston County	L	6	1,740	0	1,740

TABLE 6 (continued)

CONSTRUCTION PRIORITIES AND COST ESTIMATES

PRIORITY AND HIGHWAY SECTION	RECOMMENDED CROSS SECTION	LENGTH OF PROJECT IN MILES	COST ESTIMATES ($1,000) CONSTRUCTION	($1,000) ROW	($1,000) TOTAL
3. US 401-SR 2042 To SR 2224	B	1.5	1,550	560	2,110
4. NC 98-NC 98 Bypass Around Wake Forest to SR 1917	B	4	4,240	2,440	6,680
5. SR 1829 (Strickland Rd.)-SR 2000 To NC 50	D	3.5	3,800	370	4,170
6. NC 55-Durham County To US 64 And Harnett County To SR 2764	B	12	6,370	1,780	8,150
7. US 401-SR 2224 To Franklin County Minus Existing 4 Lanes	B	8.5	4,510	3,100	7,610
8. US 64 Bus.-SR 2348 To Little Creek Bridge Near Wendell	B	1.5	1,550	640	2,190
9. NC 50-SR 1829 To NC 98	B	6	3,180	2,550	5,730
10. NC 54-SR 1762 To North Morrisville City Limits	D	1	3,860	0	3,860
11. SR 1010 (Old NC 42)-SR 1379 To NC 50	L	13.5	3,710	1,620	5,330
12. SR 1007-SR 2516 To SR 2614	D	1.5	2,230	160	2,390
13. Outer Loop Connectors-To US 401 Bypass	L	4.5	3,330	1,370	4,700
14. Lake Wheeler Rd. (SR 1371 And SR 1375) SR 1381 To SR 1010	B	3.5	3,380	1,490	4,870
15. SR 1375 (Simpkins Rd.)-SR 1371 To US 401	B	1	640	430	1,070
16. Southern Parkway-Durham County To US 70	G	1	1,110	310	1,420
17. SR 1007 (Poole Rd.)-SR 1003 To SR 2049	L	5	1,140	600	1,740
18. NC 50-NC 98 To Granville Co.	22'	5	1,110	0	1,110
19. NC 54-Durham County To North City Limits of Morrisville	L	2.5	1,400	0	1,400
20. NC 98-NC 98 Bypass To Franklin County	22'	4	600	0	600
21. NC 42-Johnston County To US 401 And Harnett County To SR 1103	22'	10.5	1,690	0	1,690
22. NC 97-US 264 To Franklin County	22'	2	670	0	670

TABLE 6 (continued)

CONSTRUCTION PRIORITIES AND COST ESTIMATES

PRIORITY AND HIGHWAY SECTION	RECOMMENDED CROSS SECTION	LENGTH OF PROJECT IN MILES	COST ESTIMATES ($1,000) CONSTRUCTION	($1,000) ROW	($1,000) TOTAL
23. NC 96-Johnston County To SR 2347	20'	1.5	240	0	240
NC 96-SR 2337 To Franklin County	22'	12	1,930	0	1,930
24. SR 1004 (Old US 70)-SR 2560 To Johnston County	22'	4	890	0	890
25. SR 1003 (Eagle Rock Rd.)-US 401 to SR 2237	22'	8.5	1,760	0	1,760
SR 1003-SR 2365 To Johnston County	20'	4.5	750	0	750
26. SR 1945 (Mitchell Rd.)-NC 98 To US 401	22'	3	540	0	540
27. SR 1007 (Poole Rd.)-SR 2049 To SR 2516	L	2	610	240	850
28. SR 2406-Beaverdam Creek To Franklin County	22'	2.5	410	0	410
29. SR 1652 (N. Harrison Rd.)-SR 3005 To I-40	G	0.52	900	0	900
30. SR 1007 (Poole Rd.)-New Alignment From SR 1003 To SR 2049	L	6	4,300	1,530	5,830
31. SR 1005 (Six Forks Rd.)-SR 2016 To SR 1829	D	1.6	1,740	170	1,910
MINOR COLLECTORS					
1. SR 2000 (Falls Of The Neuse)-SR 1829 To SR 2006	D	2	2,170	210	2,380
SR 2000 (Falls Of The Neuse)-SR 2006 To NC 98	G	6	5,120	720	5,840
Industrial Access-SR 2000 To Us 1	L	1.75	1,370	0	1,370
2. SR 1005 (Six Forks Rd.)-SR 1829 To Bayleaf	D	3.5	3,800	210	4,010
SR 1005-Bayleaf To NC 98	G	3	2,990	260	3,250
3. SR 1829 (Strickland Rd.)-SR 1839 To Leesville	L	1	310	120	430
4. SR 2516 (Hodge Rd.)-US 64 To SR 1007	G	3.5	3,190	720	3,910
5. SR 2215 (Buffaloe Rd.)-Neuse River To 2217	G	2	1,590	240	1,830

TABLE 6 (continued)

CONSTRUCTION PRIORITIES AND COST ESTIMATES

PRIORITY AND HIGHWAY SECTION	RECOMMENDED CROSS SECTION	LENGTH OF PROJECT IN MILES	COST ESTIMATES ($1,000) CONSTRUCTION	($1,000) ROW	($1,000) TOTAL
6. SR 1006 (Old Stage Rd.)-US 401 To SR 1010	G	4.5	5,080	540	5,620
7. SR 1152 (Holly Springs Rd.)-Swift Creek To Outer Loop	L	2.5	1,170	300	1,470
8. SR 1300 (Kildare Farm Rd.)-Swift Creek To SR 1379	22'	1	220	0	220
9. SR 1822 (Leesville Rd.)-SR 3211 To SR 1837	L	2	610	240	850
10. SR 1837 (Baker Rd.)-SR 1829 To US 70	D	2.5	2,720	150	2,870
11. SR 2233 (Wade Harris Rd.)-SR 2665 To SR 1007	22'	3.3	680	0	680
12. SR 2542 (Rock Quarry Rd.)-SR 2547 To SR 2556	22'	4	660	0	660
13. SR 2556 (Rock Quarry Rd.)-SR 2542 To SR 1004	22'	1	170	0	170
14. SR 2700 (Mt. Herman Church Rd.)-SR 2547 To Johnston County	22'	2.5	520	0	520
15. SR 2547 (Log Cabin Rd.)-US 70 To SR 2700	22'	1.5	310	0	310
16. Dixie Trail Extension-SR 1381 To SR 1382	D	1	1,090	250	1,340
17. SR 1381 (Yates Mill Rd.)-SR 1379 To SR 1382	22'	2	410	0	410
18. SR 1001 (Wakefield Rd.)-Wakefield To Franklin County	22'	4	1,130	0	1,130
19. SR 1006 (Old Stage Rd.)-SR 1010 To Johnston County	22'	9	2,460	0	2,460
20. SR 1127 (Welfare Rd.)-SR 1115 to New Hill	L	5	1,540	600	2,140
21. SR 1152 (Holly Srings Rd.)-Outer Loop To Holly Springs	22'	4.5	930	0	930
22. SR 1642 (Old Chapel Hill Rd.)-Durham County To Globe Rd. Connector	22'	1.5	310	0	310
23. Globe Rd. Connector-SR 1642 To Globe Rd. At Outer Loop	22'	0.5	370	90	460

TABLE 6 (continued)

CONSTRUCTION PRIORITIES AND COST ESTIMATES

PRIORITY AND HIGHWAY SECTION	RECOMMENDED CROSS SECTION	LENGTH OF PROJECT IN MILES	COST ESTIMATES ($1,000) CONSTRUCTION	($1,000) ROW	($1,000) TOTAL
24. SR 1834-SR 1829 To NC 50	22'	3.6	750	0	750
25. SR 1909 (Mason Pond Rd.) US 1 To SR 1917	22'	4.5	930	0	930
26. SR 2006 (Mt. Vernon Church Rd.)-US 401 to SR 1005	22'	7.5	1,840	0	1,840
27. SR 2224 (Mitchell Mill Rd.)-US 401 to SR 1003	22'	4.5	930	0	930
SR 2224-SR 1003 To NC 96	20'	5	910	0	910
28. SR 2049 (Forestville Rd.)-SR 2500 To SR 1007	22'	3	530	0	530
29. SR 2770 (Trash Pile Rd.)-SR 1301 To SR 2767	22'	3	620	0	620
30. SR 3014-Outer Loop To NC 54	22'	1	270	0	270
SR 3014-NC 55 To SR 1633 Relocation	20'	0.5	200	0	200
31. SR 1839 (Bliss Rd.)-SR 1834 To Durham County	22'	1.5	810	0	810
32. SR 2012 (Litchford Rd.)-SR 2013 Toward SR 2000 1.7 Miles	22'	1.7	350	0	350
33. SR 2751 (Hilltop Rd.)-US 401 To NC 42	20'	2.5	710	0	710
34. SR 2329 (Lizzard Lick Rd.)-US 64 Bus. To SR 2320	20'	4	660	0	660
35. SR 2215 (Buffaloe Rd.)-SR 2217 To SR 2234	20'	3	500	0	500
36. SR 2234 (Cozart Rd.)-SR 2215 To SR 1003	20'	0.5	90	0	90
37. SR 2051 (Burlington Mills Rd.)-SR 2049 To US 401	20'	2	330	0	330
38. SR 2049 (Forestville Rd.)-Railroad To US 401	20'	4.5	1,450	0	1,450
39. SR 2045 (Burlington Mills Rd.)-US 1 To SR 2049	20'	2.5	410	0	410
40. SR 1917 (Harrison Rd.)-SR 1909 To NC 98	20'	2.5	410	0	410
41. SR 1615 (Greenlevel Rd.)-NC 55 To SR 1616	20'	4.5	750	0	750
42. SR 1379 (Penny Rd.)-SR 1010 To Lake Wheeler	20'	5.5	910	0	910
Lake Wheeler To SR 1382	D	1	1,590	60	1,650

TABLE 6 (continued)

CONSTRUCTION PRIORITIES AND COST ESTIMATES

PRIORITY AND HIGHWAY SECTION	RECOMMENDED CROSS SECTION	LENGTH OF PROJECT IN MILES	COST ESTIMATES ($1,000) CONSTRUCTION	($1,000) ROW	($1,000) TOTAL
43. SR 1393 (Bass Lake Rd.)-US 401 To SR 1152	20'	7	1,460	0	1,460
44. SR 1141 (Olive Chappel Rd.)-SR 1011 To SR 1143 And SR 1165 To US 64	20'	3.7	610	0	610
45. SR 1101 (Wilburn Rd.)-SR 1115 To NC 42	22'	5	1,035	0	1,035
46. SR 1110 (Maynard)-SR 1101 To NC 55	20'	2	330	0	330
47. SR 1115 (Hollemans Crossroad Rd.)-SR 1127 To Holly Springs	20'	5	1,130	0	1,130
48. SR 1301 (Sunset Lake)-SR 1152 To SR 1393 And Holland To Harnett County	20'	5.5	800	0	800
49. SR 1160 (Hunter St.)-Chatham County To SR 1161	20'	5	1,130	0	1,130
50. SR 1613 (Stone Rd.)-SR 1614 To SR 3014	20'	4.5	750	0	750
51. SR 1907 (Newlite Rd.)-NC 98 To Granville County	20'	6	1,000	0	1,000
52. SR 1942 (Juniper St.)-SR 1941 To NC 96	20'	3.5	880	0	880
53. SR 2217 (Allen Store Rd.)-SR 2049 To SR 1003	20'	5.5	1,210	0	1,210
54. SR 2358 (Lake Glad Rd.)-Southern City Limits Wendell To SR 1003	20'	2	330	0	330
55. SR 2349 (Morphus Bridge Rd.)-South City Limits Zebulon To SR 2352	20'	2.5	410	0	410
56. SR 2352 (Corbin Rd.)-SR 2349 To SR 2353	20'	0.5	380	0	380
57. SR 2353 (Morphus Bridge Rd.)-SR 2352 To US 64 Bus.	20'	2	330	0	330
58. SR 2320 (Avon Privette Rd.)-SR 1003 To NC 96 And US 64 To NC 97	20'	8	1,320	0	1,320
59. SR 2308 (Fowler)-SR 2329 To NC 96	20'	0.5	80	0	80

TABLE 6 (continued)

CONSTRUCTION PRIORITIES AND COST ESTIMATES

PRIORITY AND HIGHWAY SECTION	RECOMMENDED CROSS SECTION	LENGTH OF PROJECT IN MILES	COST ESTIMATES ($1,000) CONSTRUCTION	($1,000) ROW	($1,000) TOTAL
60. SR 2345 (Loop Rd.)-Railroad To Johnston County	20'	2	330	0	330
61. SR 2767 (Sutton Rd.)-East City Limits Fuquay To NC 55	20'	2	290	0	290
62. SR 2754 (Rawl Rd.)-NC 42 To SR 2765	20'	1	170	0	170
63. SR 1611 (Old Jenks Rd.)-SR 1614 To NC 55	20'	2	330	0	330
64. SR 1382 (Hunter Rd.)-SR 1380 To SR 1379	D	0.5	380	50	430
65. SR 1152 (Holly Springs Rd.)-Holly Springs To SR 1153	22'	1.5	310	0	310
66. SR 1153 (Old Holly Springs Rd.)-Pave Dirt Rd. From SR 1152 To US 1	22'	3.5	2,330	0	2,330
67. SR 1923 (Thomson Mill Rd.)-Relocate Between SR 2000 and US 1	20'	0.75	850	230	1,080

VIII. IMPLEMENTATION

There are several tools which are available for use by a county to assist in the implementation of a Thoroughfare plan. They are as follows:

State-County Adoption of Thoroughfare Plan

If requested, the Department of Transportation in cooperation with a county will cooperatively develop and mutually approve a county Thoroughfare plan. The mutually approved plan would serve as a guide to the Department of Transportation in the development of the road and highway system of the county. The approval of the plan by the county would enable subdivision regulations and zoning ordinances to be effectively used to assist in the implementation of the plan.

Subdivision Controls

The subdivision regulations require every subdivider to submit to the county planning commission a plan of his proposed subdivision and requires that the subdivision be constructed to certain standards. Through this process, it is possible to require the subdivision streets to conform to the Thoroughfare plan and to reserve or protect necessary rights-of-way for projected roads and highways that are to become a part of the Thoroughfare plan. The construction of subdivision streets to adequate standards would reduce maintenance costs and would facilitate the transfer of the streets to the State Highway System. Appendix B outlines the Department of Transportation's Recommended Design standards.

Zoning

The zoning ordinance is an important tool in that it will regulate future land development and minimize undesirable development along roads and highways. The zoning ordinance can improve highway safety by requiring sufficient building setbacks to provide for adequate sight distances and by requiring off-street parking.

Funding

As stated in Chapter V, most all highway improvements are scheduled and funded by the Transportation Improvement Program. The Board of Transportation regularly conducts public meetings to obtain input from the public as to their needs for highway improvements.

However, not all roadway improvements are covered by this procedure. Nearly all secondary road work is done on a county

by county basis with funds from both the legislature and road bonds. These funds (county construction account) are used to pave unimproved roads, widen roadways, stabilize dirt roads, make minor alignment improvements, and even construct short connectors when appropriate. The county commissioners are encouraged to work with the Division Engineer when the county's priority list is developed. Many of the minor improvements recommended may be realized by using the county's construction account funds and cooperatively developing the county's priority list with the Division Engineer.

APPENDIX

APPENDIX A - THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

APPENDIX B - RECOMMENDED DEFINITIONS AND DESIGN STANDARDS FOR SUBDIVISION ORDINANCES

APPENDIX A

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X-SECTION DIST MI	ROWY FT	RC FT	CAPACITY CURRENT (FUTURE)	1979 ADTS	2000 ADTS	RECOMMENDED X-SECTION ROWAY (ULT)	RECOMMENDED X-SECTION ROW (ULT)
I 40								
DURHAM COUNTY TO SR1635	6.2	48	340	60000	20000	40000	ADQ	ADQ
US70 TO JOHNSTON COUNTY	5.4	-	-	60000	-	22000	A	228
US 1								
CHATHAM COUNTY FOR 3.14 MI.	3.14	24	240	4000	3000	7000	A	ADQ
PLUS 0.74 MI.	0.74	48	270	50000	3000	7000	ADQ	ADQ
PLUS 4.34 MI.	4.34	24	260	4000	5200	9000	A	ADQ
TO NC55	0.57	48	260	50000	6500	12000	ADQ	ADQ
SR2013 TO US1A	5.5	48	200	50000	11000	24000	ADQ	ADQ
US 64								
CHATHAM COUNTY TO NC 55	3.5	24	60	4000	5000	8000	B	200
NEUSE RIVER TO SR2233	3.0	48	150	33000	23000	43000	[illegible]	ADQ
SR2233 TO US64 BUS.	3.5	48	350	40000	21500	36000	ADQ	ADQ
US64 BUS TO NC96	6.6	48	200	60000	15000	50000	ADQ	ADQ
NC96 TO FRANKLIN COUNTY	3.3	48	290	60000	15000	50000	ADQ	ADQ
US 64 (NEW ALIGNMENT)								
BELTLINE TO US64 BUS.	-	-	-	(60000)	-	-	(A)	228
US 64 BUSINESS								
LITTLE CREEK TO SR2343	1.5						B	200
US64BYP. TO NC97	2.8	48	200	48000	7000	-	ADQ	ADQ
US 70								
PROPOSED I-40 TO JOHNSTON COUNTY	4.3	48	200	48000	15500	20000	ADQ	ADQ
DURHAM COUNTY TO SR1664	6.8	48	80	50000	21500	29000	ADQ	ADQ
US 264								
NC97 TO FRANKLIN COUNTY	2.25	48	300	60000	6500	-	ADQ	ADQ
US 264A								
NC 97 TO JOHNSTON COUNTY	2.0	24	60	6000	1300	3000	ADQ	ADQ
US 401								
BYPASS AROUND FUQUAY	5.0	-	-	-	-	5000	L	200
HARNETT COUNTY TO FUQUAY-VARINA PLANNING CORDON	0.5	24	60	6000	4600	4000	ADQ	ADQ
FUQUAY VARINA PLANNING CORDON FOR 0.5 MI.	0.5	24	80	4000	9900	15900	A	228
0.5 MI. TO SR2782	8.25	48	150	40000	15000	25000	ADQ	ADQ
SR2042 TO SR2052	6.0	20	80	6000	7800	14000	B	200
SR2052 FOR 0.65 MI.	0.65	44	60	30000	6500	12000	ADQ	ADQ
0.65 MI. TO FRANKLIN COUNTY	3.3	20	80	6000	4000	6400	B	200

APPENDIX A (CONTINUED)

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X-SECTION DIST MI	ROWY FT	RCW FT	CAPACITY (FUTURE) CURRENT	1979 ADTS	2000 ADTS	RECOMMENDED X-SECTION ROWAY (ULT)	RCW (ULT)
NC 39								
JOHNSTON COUNTY PLUS 0.44 MI.	0.44	20	60	6000	300	1600	ADQ	ADQ
PLUS 0.52 MI.	0.52	60	100	30000	300	2000	ADQ	ADQ
TO FRANKLIN COUNTY	2.10	20	60	6000	900	1600	ADQ	ADQ
NC 42								
HARNETT COUNTY TO SR1103	1.50	20	60	6000	1600	2400	22	ADQ
NC55 TO JOHNSTON COUNTY	9.00	20	100	6000	1600	2900	22	ADQ
NC 50								
SR 2562 TO JOHNSTON COUNTY	6.0	20	100	6000	6100	5000	L	100
SR1329 TO NC98	4.0	20	60	6000	3200	6600	B	200
NC98 PLUS 1.62 MI.	1.62	20	60	6000	2400	4300	22	ADQ
PLUS 1.04 MI.	1.04	24	230	6000	2400	4300	ADQ	ADQ
TO GRANVILLE COUNTY	3.53	20	60	6000	2400	3900	22	ADQ
NC 54								
DURHAM COUNTY TO NORTH CITY LIMITS OF MORRISVILLE	2.50	18	100	6000	3600	4000	L	ADQ
CITY LIMITS TO SR1762	3.00	18	100	6000	4900	6100	D	ADQ
NC 55								
HARNETT COUNTY TO SR2764	2.50	24	60	6000	7300	12000	B	200
BASAL CREEK TO SR1395	2.00	20	60	6000	6000	11000	B	200
SR1395 TO RAILROAD CROSSING	1.00	20	60	6000	7700	12000	D	80
RAILROAD CROSSING TO SR1444	3.86	20	100	6000	9000	15000	B	200
SR1444 TO US 1	0.14	24	100	6000	9000	15000	D	ADQ
US64 TO DURHAM COUNTY	9.50	22	150	6000	4500	8000	B	200
NC 96								
JOHNSTON COUNTY TO SR2347	1.5	18	60	6000	1000	1600	20	ADQ
SR2337 TO FRANKLIN COUNTY	12.0	20	100	6000	1600	2200	22	ADQ
NC 97								
US264 TO FRANKLIN COUNTY	2.0	20	60	6000	2000	-	22	ADQ
US64BUS. TO ZEBULON PLANNING CORDON		22	100	6000	4600	8000	ADQ	ADQ
NC 98								
DURHAM COUNTY TO SR1917	6.0	24	60	6000	2700	3600	ADQ	ADQ
SR1917 TO NC98 BYPASS	3.75	24	60	6000	3600	11000	B	200
NC98 BYP. TO FRANKLIN COUNTY	4.0	20	60	6000	2200	3000	22	ADQ
SR 1001(WAKEFIELD RD.) WAKEFIELD TO FRANKLIN COUNTY	4.00	18	60	6000	1100	2000	22	ADQ
SR 1002(AIRPORT RD.) SR3015 TO LOOP	0.70	24	60	6000	4470	-	ADQ	ADQ

APPENDIX A (CONTINUED)

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X-SECTION DIST	ROWY	RCW	CAPACITY CURRENT (FUTURE)	1979 ADTS	2000 ADTS	RECOMMENDED X-SECTION ROWAY (ULT)	RCW (ULT)
	MI	FT	FT					
SR 1003(EAGLE ROCK RD.)								
US401 FOR 1.11 MI.	1.11	20	60	6000	2300	3400	22	ADQ
PLUS 7.25 MI.	7.25	18	60	6000	1300	2500	22	ADQ
PLUS 3.60 MI.	3.6	24	60	6000	1000	3000	ADQ	ADQ
TO JOHNSTON COUNTY	5.3	18	60	6000	800	-	20	ADQ
SR1004(OLD US70)								
SR2560 TO JOHNSTON COUNTY	4.00	20	60	6000	3900	4500	22	ADQ
SR 1005(SIX FORKS RD)								
SR2016 TO SR1329	1.58	20	60	6000	-	12000	D	80
SR1329 TO BAYLEAF	3.50	20	60	6000	3900	11000	D	80
BAYLEAF TO NC98	3.0	18	60	6000	-	6000	C	100
SR1006(OLD STAGE RD.)								
US401 TO SR1010	4.50	18	60	6000	3100	6500	C	100
SR1010 TO JOHNSTON COUNTY	9.00	18	60	6000	1300	2000	22	ADQ
SR 1007(POOLE RD)								
SR1003 TO MARKS CREEK	2.53	20	60	6000	900	2000	L	100
MARKS CREEK TO SR2516	5.00	18	60	6000	1400	2800	L	100
SR2516 TO SR2614	1.50	18	60	6000	3000	6000	D	80
SR1007(NEW ALIGNMENT)								
SR1003 TO SR2049	3.00	-	-	-	-	-	L	100
SR 1010(OLD NC42)								
SR1379 TO NC50	13.0	20	60	6000	2800	5200	L	100
NC50 TO JOHNSTON COUNTY	1.0	20	60	6000	1050	1600	ADQ	ADQ
SR 1011(OLD US1)								
WEST CITY LIMITS APEX TO CHATHAM COUNTY	7.70	22	60	6000	1750	3500	ADQ	ADQ
SR 1100(WAGSTAFF RD.)								
SR1101 TO RAILROAD TRACKS	0.40	20	60	6000	600	-	ADQ	ADQ
SR 1101(WILBURN RD.)								
SR1115 TO NC42	5.00	18	60	6000	1500	2500	22	ADQ
NC42 TO SR1100	1.00	20	60	6000	1300	-	ADQ	ADQ
SR 1110(MAYNARD)								
SR1101 TO NC55	2.00	18	60	6000	800	1900	20	ADQ
SR 1115(HOLLEMANS CROSSROAD RD.)								
SR1127 TO HOLLY SPRINGS	5.00	18	60	6000	600	1500	20	ADQ
SR 1127(WELFARE RD.)								
SR1115 TO NEW HILL	5.00	18	60	6000	2600	4600	L	100

APPENDIX A (CONTINUED)

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	RCWY FT	ROW FT	CAPACITY CURRENT (FUTURE)	1979 ADTS	2000 ADTS	RECOMMENDED X - SECTION RDWAY (ULT)	ROW (ULT)
SR 1141(NEW HILL ROAD)								
SR1011 TO SR1143	2.20	18	60	6000	700	1300	20	ADQ
SR1143 TO SR1165	0.90	24	200	6000	700	1300	ADQ	ADQ
SR1165 TO US64	1.50	18	60	6000	700	1300	20	ADQ
SR 1182(HOLLY SPRINGS RD.)								
SWIFT CREEK TO OUTER LOOP	2.50	18	60	6000	1300	3000	L	100
LOOP TO HOLLY SPRINGS	4.50	18	60	6000	1300	3000	22	ADQ
HOLLY SPRINGS TO SR1153	1.50	18	60	6000	100	-	22	ADQ
SR 1183(OLD HOLLY SPRINGS RD.)								
SR1152 TO US1	3.50	34	60	6000	200	-	22	ADQ
SR 1190(HUNTER ST.)								
CHATHAM COUNTY TO SR1161	5.00	18	60	6000	400	500	20	ADQ
SR 1300(KILDARE FARM RD.)								
SWIFT CREEK TO SR1379	1.00	20	60	6000	1900	5000	22	ADQ
SR 1301(SUNSET LAKE)								
SR1162 TO SR1393	3.20	18	60	6000	600	1300	20	ADQ
HOLLAND TO HARNETT COUNTY	2.30	18	60	6000	400	-	20	ADQ
SR 1371(LAKE WHEELER RD.)								
SR1381 TO SR 1375	1.40	18	60	6000	5000	13000	B	200
SR 1375(JIMPKINS RD.)								
US401 TO SR1371	1.14	24	60	6000	4500	9000	B	200
SR1371 PLUS 1.96 MI.	1.96	18	60	6000	3700	8600	B	200
TO SR1010	0.40	20	60	6000	2400	5100	B	200
SR1010 TO SR1393	3.42	20	60	6000	1000	1500	ADQ	ADQ
SR 1379 (PENNY ROAD)								
SR1382 TO LAKE WHEELER	1.00	18	60	6000	700	6000	D	80
LAKE TO SR1010	5.50	18	60	6000	800	-	20	ADQ
SR 1381(YATES MILL RD.)								
SR1379 TO SR1382	2.00	18	60	6000	1600	4000	22	ADQ
SR 1382(WILSON RD.)								
SR1380 TO SR1379	0.50	20	60	6000	1400	8000	D	80
SR 1393(BASS LAKE RD.)								
US401 TO SR1152	7.00	18	60	6000	900	1300	20	ADQ
SR 1611(OLD JENKS RD.)								
SR1614 TO NC55	2.00	18	60	6000	900	-	20	ADQ

APPENDIX A (CONTINUED)

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X-SECTION DIST MI	ROWY FT	RCW FT	CAPACITY CURRENT (FUTURE)	1979 ADTS	2000 ADTS	RECOMMENDED X-SECTION ROWAY (ULT)	RECOMMENDED X-SECTION ROW (ULT)
SR 1613 (STONE RD.)								
SR1614 TO SR3014	4.50	18	60	6000	650	-	20	ADQ
SR 1615(GREENLEVEL RD.)								
NC55 TO SR1616	4.50	18	60	6000	300	1500	20	ADQ
SR 1642 (OLD CHAPEL HILL RD)								
DURHAM COUNTY TO GLOBE RD. CONNECTOR	1.50	18	60	6000	1600	3000	22	ADQ
SR 1652(N.HARRISON RD.)								
SR3005 TO I-40	0.52	24	150	6000	5600	10000	G	ADQ
I-40 TO STATE PARK	0.25	24	150	6000	-	-	ADQ	ADQ
SR 1822(LEESVILLE RD.)								
SR1837 TO SR3211	2.00	18	60	6000	1700	4700	L	100
SR 1829(STRICKLAND RD.)								
NC50 PLUS 1.6 MI.	1.6	18	60	6000	3900	10000	D	80
TO SR2000	1.7	24	60	6000	3900	9700	D	80
SR1839 PLUS 2.25 MI.	2.25	18	60	6000	2500	5000	L	100
TO NC50	1.4	24	60	6000	4000	4000	ADQ	ADQ
SR 1834								
SR1829 TO NC50	3.60	18	60	6000	1070	2600	22	ADQ
SR 1837(BAKER RD.)								
LEESVILLE PLUS 0.9 MI.	0.90	18	60	6000	2300	6000	D	80
0.9 TO US70	1.60	20	60	6000	2300	6000	D	80
SR 1839(BLISS RD.)								
SR1834 TO DURHAM COUNTY	1.50	18	60	6000	500	2000	22	ADQ
SR 1907(NEWLITE RD.)								
NC98 TO GRANVILLE COUNTY	6.00	18	60	6000	500	1000	20	ADQ
SR 1909(MASON POND RD.)								
SR1917 TO US1	4.50	18	60	6000	1200	2200	22	ADQ
SR 1917(HARRISON RD.)								
NC98 TO SR1909	2.50	18	60	6000	900	1600	20	ADQ
SR 1923(THOMSON MILL RD.)								
RELOCATE BETWEEN NC2000 AND NEW NC98	0.75	20	60	6000	300	12600	G	100
SR 1942(JUNIPER ST.)								
SR1941 TO NC96	3.50	18	60	6000	200	-	20	ADQ

APPENDIX A (CONTINUED)

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X-SECTION DIST	ROW	PC	CAPACITY CURRENT (FUTURE)	1979 ADTS	2000 ADTS	RECOMMENDED X-SECTION PO WAY (ULT)	PC (ULT)
	MI	FT	FT					
SR 1945 (MITCHELL RD.)								
NC96 TO SR2053	1.30	18	60	6000	2000	3500	22	ADQ
SR2053 TO US-01	1.95	20	60	6000	2000	3500	22	ADQ
SR 2000(FALLS OF THE NEUSE)								
SR2006 TO NC98	5.0	20	60	6000	3000	20000	3	100
SR1829 TO 2006	2.0	24	60	6000	6000	12000	0	80
SR 2006(MT.VERNON CHURCH RD)								
SR2000 TO US-01	4.10	18	60	6000	1500	3500		
SR2000 TO SR1005	3.40	20	60	6000	450	2000	22	ADQ
SR 2012(LITCHFORD RD.)								
SR2013 TOWARD SR2000 FOR 1.7 MI.	1.70	18	60	6000	1200	1800	22	ADQ
SR 2045(BURLINGTON MILLS RD)								
US1 TO SR2049	3.50	18	60	6000	1300	-	20	ADQ
SR 2049(FORESTVILLE RD.)								
FORESTVILLE TO US401	4.50	18	60	6000	700	1300	20	ADQ
US64 TO SR2500	0.60	24	60	6000	2700	3700	ADQ	ADQ
SR2500 PLUS 0.03 MI.	0.03	20	60	6000	2700	3700	22	ADQ
TO SR2513	0.13	38	60	12000	2700	3700	ADQ	ADQ
TO SR2233	0.10	20	60	6000	1800	2900	22	ADQ
TO SR1007	2.74	18	60	6000	1800	2900	22	ADQ
SR 2051(BURLINGTON MILLS RD)								
SR2049 TO US401	2.00	18	60	6000	1000	1600	20	ADQ
SR 2215(BUFFALOE RD.)								
NEUSE RIVER TO SR2217	2.00	24	60	6000	1400	6800	3	100
SR2217 TO SR2234	3.20	18	60	6000	300	1300	20	ADQ
SR 2217(ALLEN STORE RD.)								
US64 TO SR2049	2.8	20	60	6000	500	1000	ADQ	ADQ
SR2049 TO SR1003	5.50	18	60	6000	700	1000	20	ADQ
SR 2224(MITCHELL MILL RD.)								
US401 TO SR1003	4.50	18	60	6000	1600	4000	22	ADQ
SR1003 TO NC96	5.00	18	60	6000	500	-	20	ADQ
SR 2233(WADE HARRIS RD.)								
SR2665 TO SR1007	3.30	18	60	6000	2000	3000	22	ADQ
SR2665 TO US 64	1.40	24	60	6000	2700	3700	ADQ	ADQ
SR 2234(COZART RD.)								
SR2215 TO SR1003	3.50	18	60	6000	1500	1900	20	ADQ

APPENDIX A (CONTINUED)

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	EXISTING X - SECTION RDWY FT	EXISTING X - SECTION ROW FT	CAPACITY CURRENT (FUTURE)	1979 ADTS	2000 ADTS	RECOMMENDED X - SECTION RDWAY (ULT)	RECOMMENDED X - SECTION ROW (ULT)
SR 2308(PO-LEP)								
SR2309 TO NC96	0.50	18	60	6000	600	-	20	ADQ
SR 2320(AVON PRIVETTE RD.)								
SR1003 TO NC96	7.00	18	60	6000	1300	-	20	ADQ
US64 TO NC97	1.30	18	60	6000	1300	-	20	ADQ
SR 2329(LIZZARD LICK RD.)								
US64BUS. PLUS 0.11 MI.	0.11	30	60	12000	-	-	ADQ	ADQ
PLUS 3.65 MI.	3.65	18	60	6000	1300	-	20	ADQ
TO SR2308	2.90	20	60	6000	400	-	ADQ	ADQ
SR 2345(LOCK RD.)								
RAILROAD TO JOHNSTON COUNTY	2.00	18	60	6000	600	-	20	ADQ
SR 2349(MORPHUS BRIDGE RD.)								
SOUTH CITY LIMITS OF ZEBULON TO SR2352	2.50	18	60	6000	500	-	20	ADQ
SR 2352(CORBIN RD.)								
SR2349 TO SR2353	0.50	18	60	6000	900	-	20	ADQ
SR 2353(MORPHUS BRIDGE RD.)								
SR2352 TO US64 BUS.	2.00	18	60	6000	900	-	20	ADQ
SR 2358(LAKE GLAD RD.)								
SOUTH CITY LIMITS WENDELL TO SR1003	2.00	18	60	6000	1100	-	20	ADQ
SR 2406								
BEAVERDAM CREEK TO FRANKLIN COUNTY	2.5	20	100	6000	2100	-	22	ADQ
SR 2516(HODGE RD.)								
US64 TO SR1007	3.50	18	60	6000	3100	6300	5	100
SR 2542(ROCK QUARRY RD.)								
SR2556 TO SR2547	4.00	20	60	6000	4000	5000	22	ADQ
SR 2547(LOG CABIN RD.)								
US70 TO SR2700	1.50	18	60	6000	2800	4800	22	ADQ
SR 2556(ROCK QUARRY RD.)								
SR1004 TO SR2542	1.00	20	60	6000	3200	5000	22	ADQ
SR 2700(MT.HERMAN CHURCH RD)								
SR2547 TO JOHNSTON COUNTY	2.50	18	60	6000	600	1000	22	ADQ

APPENDIX A (CONTINUED)

THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

FACILITY & SECTION	EXISTING X - SECTION DIST MI	ROWY FT	RCW FT	CAPACITY CURRENT (FUTURE)	1979 ADTS	2000 ADTS	RECOMMENDED X - SECTION RDWAY (ULT)	ROW (ULT)
SR 2751(HILLTOP RD.)								
US401 TO NC42	2.50	18	60	6000	1100	-	20	ADQ
SR 2754(RAWL RD.)								
NC42 TO SR2765	1.00	18	60	6000	700	-	20	ADQ
SR 2765(PAUL HONEYCUTT RD.)								
NC55 TO SR2754	1.30	20	60	6000	300	-	ADQ	ADQ
SR 2767 (SUTTON RD.)								
EAST CITY LIMITS FUQUAY TO NC55	2.00	18	60	6000	380	3000	20	ADQ
SR 2770(TRASH PILE RD.)								
HARNETT COUNTY PLUS 0.2 MI.	0.20	20	60	6000	-	-	ADQ	ADQ
TO SR2767	2.90	18	60	6000	2900	-	22	ADQ
SR 3014								
NC55 TO NC54	3.33	18	60	6000	1500	1900	20	ADQ
SR 3015								
NC54 TO SR1002	3.50	22	60	6000	1300	3000	ADQ	ADQ
DIXIE TRAIL EXTENSION								
SR1381 TO SR1382	1.00	-	-	-	-	3000	D	80
GLOBE ROAD CONNECTOR								
SR1642 TO GLOBE RD. AT OUTER LOOP	0.50	-	-	-	-	3000	22	6
INDUSTRIAL ACCESS ROAD								
PROPOSED BETWEEN SR2000 AND US1	1.75	-	-	-	-	13800	L	150
OUTER LOOP								
US1 AT GRESHAM'S LAKE TO US70 AT SR1002	12.0	-	-	-	-	-	B	200
US70 TO I-40	4.0	-	-	-	-	-	D	80
I-40 TO SR1300	16.0	-	-	-	-	-	A	228
SR1300 TO PROPOSED I-40 (TO BENSON)	14.0	-	-	-	-	-	A	228
PROPOSED I-40 TO US1 AT GRESHAM'S LAKE	14.0	-	-	-	-	-	A	228
OUTER LOOP CONNECTOR								
TO US401 BYPASS	4.50	-	-	-	-	-	L	100
SOUTHERN PARKWAY								
DURHAM COUNTY TO US70	1.00	-	-	-	-	15000	F	100

APPENDIX B

RECOMMENDED DEFINITIONS AND DESIGN STANDARDS FOR SUBDIVISION ORDINANCES

DEFINITIONS:

I. Streets and Roads:

A. Rural Roads

1. Principal Arterial - A rural link in a network of continuous routes serving corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.

2. Minor Arterial - A rural link in a network joining cities and larger towns and providing intrastate and intercounty service at relatively high overall travel speeds with minimum interference to through movement. This network would primarily serve traffic.

3. Major Collector - A road which serves major intracounty travel corridors and traffic generators and provides access to the Arterial system.

4. Minor Collector - A road which provides service to small local communities and links the locally important traffic generators with their rural hinterland.

5. Local Road - A local road that serves primarily to provide access to adjacent land and for travel over relatively short distances.

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of Interstate, other freeway, expressway, or parkway links, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. Minor Thoroughfares - Minor thoroughfares are important streets in the city system and perform the function of collecting traffic from local access streets and carrying it to the Major Thoroughfare system. Minor thoroughfares may be used to supplement the Major Thoroughfare system by facilitating a minor through-traffic movement and may also serve abutting property.

3. Local Street - A local street is any link not on a higher-order urban system and serves primarily to provide direct access to abutting land and access to higher systems.

C. Specific Type Rural or Urban Streets

1. Freeway, expressway, or parkway - Divided multilane roadways designed to carry large volumes of traffic at relatively high speeds. A freeway is a divided highway providing for continuous flow of vehicles with no direct access to abutting property or streets and with access to selected crossroads provided via connecting ramps. An expressway is a divided highway with full or partial control of access and generally with grade separations at major intersections. A parkway is a highway for noncommercial traffic, with full or partial control of access, and usually located within a park or a ribbon of parklike development.

2. Residential Collector Street - A local access street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. Local Residential Street - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. Cul-de-sac - A short street having but one end open to traffic and the other end being permanently terminated and a vehicular turn around provided.

5. Frontage Road - A local street or road that is parallel to a full or partial access controlled facility and functions to provide access to adjacent land.

6. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

A. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.

B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

C. Lot - A portion of a subdivision, or any other parcel of land, intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

1. Corner Lot - A lot abutting upon two streets at their intersection.

2. Double-Frontage Lot - A continuous (through) lot which is accessible from both of the parallel streets upon which it fronts.

3. Reverse-Frontage Lot - A continuous (through) lot which is accessible from only one of the parallel streets upon which it fronts.

III. Subdivision

A. Subdivider - Any person, firm, corporation or official agent thereof, who subdivides or develops any land deemed to be a subdivision.

B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, whether immediate or future, of sale or building development, and all divisions of land involving the dedication of a new street or a change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or recombination of portions of previously platted lots where the total number of lots is not increased and the resultant

lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than five acres where no street right-of way dedication is involved; (3) the public acquisition by purchase of strips of land for the widening or opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. Since a transfer of property is involved, the dedication is made by written instrument and is completed with an acceptance.

D. Reservation - A reservation of land does not involve any transfer of property rights. It simply constitutes an obligation to keep property free from development for a stated period of time.

Design Standards

I. Streets and Roads:

The design of all streets and roads within _____ shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway and Transportation Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the requirements of the thoroughfare plan for _____ as approved by the city and adopted by the city and the North Carolina Board of Transportation.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

The urban planning area shall consist of that area within the urban planning boundary as depicted on the mutually adopted _____ Thoroughfare Plan.

The rural planning area shall be that area outside the urban planning boundary.

A. Right-of-Way Widths: Right-of-way widths shall not be less than the following and shall apply except in those cases where right-of-way requirements have been specifically set out in the _____ Thoroughfare Plan.

		Min. Right of Way, Ft.
1.	Rural	
a.	Principal Arterial	
	Freeways	250
	Other	200
b.	Minor Arterial	100
c.	Major Collector	100
d.	Minor Collector	100
e.	Local Road	*60

*The desirable minimum right-of-way is 60 feet. If curb and gutter is provided, 50 feet of right-of-way is adequate on local residential streets.

		Min. Right of Way, Ft.
2.	Urban	
a.	Major Thoroughfare Other than Freeway and Expressway	90
b.	Minor Thoroughfare	70
c.	Local Street	*60
d.	Cul-de-sac	**Variable

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. In all cases in which right-of-way is sought for an access controlled facility, the subdivider will only be required to make a reservation.

A partial width right-of-way, not less than sixty (60) feet in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

B. Street Widths: Widths for street and road classifications other than local shall be as required by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

a. Local Residential
Curb and gutter section - 26 feet, to face of curb
Shoulder section - 20 feet to edge of pavement, 4 foot shoulders

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*The desirable minimum right-of-way is established as 60 feet. If curb and gutter is provided, 50 feet of right-of-way is adequate.

**The right-of-way dimension will depend on radius used for vehicular turn-around. Distance from edge of pavement of turn around to right-of-way should not be less than distance from edge of pavement to right-of-way on street approaching turn-around.

b. Residential Collector
Curb and gutter section - 34 feet, face to face of curb
Shoulder Section - 20 feet to edge of pavement, 6 foot shoulders

C. Geometric Characteristics: The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

1. Design Speed

The design speeds for subdivisions type streets shall be:

	Desirable	(Minimum)		
		Level	Rolling	Mountainous
Rural				
Minor Collector Roads	60	(50)	(40)	(30)
Local Roads including Residential Collectors and Local Residential	50	(50)*	(40)*	(30)*
Urban				
Major Thoroughfares Other than Freeway or Expressway	60	(50)	(50)	(50)
Minor Thoroughfares	60	(50)	(40)	(40)
Local Streets	40	(40)**	(30)**	(20)**

*Based on projected annual average daily traffic of 400-750. In cases where road will serve a very limited area and small number of dwelling units, minimum design speeds can be reduced further.

**Based on projected annual average daily traffic of 50-250.

2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

Design Speed	Level	Rolling	Mountainous
60	3	4	6
50	4	5	7
40	5	6	8
30		9	10
20			12

b. A minimum grade for curbed streets normally should not be less than 0.5%, a grade of 0.35% may be allowed where there is a high type pavement accurately crowned and in areas where special drainage conditions may control.

c. Grades for 100 feet each way from intersections should not exceed 5%.

d. For streets and roads with projected annual average daily traffic less than 250, short grades less than 500 feet long, may be 150% greater.

3. Minimum Sight Distances

In the interest of public safety, no less than the minimum sight distance applicable shall be provided in every instance. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters. (General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case):

DESIGN SPEED, MPH	20	30	40	50	60
Stopping Sight Distance -					
i. Min. Stopping Distance, Ft.	150	200	275	350	475
Des. Stopping Distance, Ft.	150	200	300	450	650
ii. Min. K* Value For:					
a. Min. Crest Vert. Curve	16	28	55	85	160
Des. Crest Vert. Curve	16	28	65	145	300
b. Min. SAG Vert. Curve	24	35	55	75	105
Des. SAG Vert. Curve	24	35	60	100	155
Passing Sight Distance -					
i. Min. Passing Distance, Feet (2 lane)		1100	1500	1800	2100
ii. Min. K* Value For Crest Vertical Curve		365	686	985	1340

Sight distance provided for stopped vehicles at intersections should be in accordance with, "A Policy on Geometric Design of Rural Highways".

4. The following table shows the maximum degree of curve and related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads wth no curb and gutter is .08. The maximum rate of superelevation for urban streets with curb and gutter is .06 with .04 being desirable.

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*K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide minimum sight distance.

Design Speed MPH	Maximum e*	Minimum Radius (Rounded) Feet	Maximum Degree of Curve (Rounded) Degrees
20	.04	125	45.0
30	.04	300	19.0
40	.04	560	10.0
50	.04	925	6.0
60	.04	1410	4.0
20	.06	115	50.0
30	.06	275	21.0
40	.06	510	11.5
50	.06	830	7.0
60	.06	1260	4.5
20	.08	110	53.5
30	.08	250	23.0
40	.08	460	12.5
50	.08	760	7.5
60	.08	1140	5.0

*e = rate of roadway superelevation, foot per foot

D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty (60) degrees.

2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Off-set intersections are to be avoided unless exception is granted by the Divison of Highways. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

E. Cul-de-sacs

Cul-de-sacs, unless exception is granted by the local planning board, shall not be more than five hundred (500) feet in length. The distance from the edge of pavement on the vehicular turn-around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn-around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provision is made for service access.

   Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least twenty (20) feet.

3. Dead-end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn-around facilities at the dead-end as may be approved by the Planning Board.

4. Sharp changes in alignment and grade shall be avoided.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the nearest District Engineer of the Divison of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

I. Wheel Chair Ramps

In accordance with Chapter 136, Article 2A, §136-44.14, all street curbs in North Carolina being constructed or re-constructed for maintenance procedures, traffic operations, repairs, correction of utilities, or altered for any reason after September 1, 1973, shall provide wheelchair ramps for the physically handicapped at all intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

Wheelchair ramps and depressed curbs shall be constructed in accordance with details contained in the Department of Transportation, Divison of Highways, Publication entitled, "Guidelines, Curb Cuts and Ramps for Handicapped Persons".

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and re-constructed bridges serving 2 lane, 2-way traffic should be as follows:

   a. Shoulder Section Approach

      i. Under 800 ADT Design Year
      Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.

      ii. 800-2000 ADT Design Year
      Minimum 34 feet width face to face of parapets or rails or pavement width plus 12 feet, whichever is greater.

      iii. Over 2000 ADT Design Year
      Minimum 40 feet
      Desirable 44 feet width face to face of parapets or rails.

   b. Curbs and Gutter Approach

      i. Under 800 ADT Design Year
      Minimum 24 feet face to face of curbs.

      ii. Over 800 ADT Design Year
      Width of approach pavement measured face to face of curbs.

   Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the

curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1'-6" minimum, or greater if sidewalks are required.

2. The clear roadway widths for new and re-constructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

   a. Shoulder Section Approach - Width of approach pavement plus width of usable shoulders on the approach left and right.
      Min. 8'
      Des. 10'
   b. Curb and Gutter Approach - Width of approach pavement measured face to face of curbs.

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